

# Training and education in digital curation in Germany, Austria, and Switzerland

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## Abstract

Established in 2005 as part of the German nestor competence network, the nestor “Qualification” working group addresses questions of training and education in digital preservation for a broad and heterogeneous target audience. We introduce the five core areas of activity of the working group, giving an overview of the lessons learned and an outlook on future developments. In particular, we focus on the cooperation in the field of initial vocational education and the development of shared curricular modules in this area.

## Digital curation training and education for a heterogeneous audience

Over the past 15 years, the digital curation community has built an expansive, almost overwhelmingly large body of knowledge, ranging from comprehensive theoretical and conceptual works to practical solutions for concrete digital preservation problems. Yet current studies show that we are still dealing with a skills gap in the field of digital curation [1], [2]. Accordingly, a significant need exists for both continuing professional education and initial vocational training and education.

To address this need in Germany, Austria, and Switzerland, in 2005 nestor, the German-language competence network for digital preservation [3] set up a working group focused on qualification issues. Because of the anticipated impact the group’s work would have on university curricula and course offers, a Memorandum of Understanding (MoU) was signed in 2007 and renewed in 2009 as nestor was transformed from a publicly funded project to a membership organization. This MoU constitutes the formal basis and framework for the work of this group (hereafter MoU-Group [4]), which today consists of 13 partners from higher education institutions, research organizations, institutions in the heritage sector, among them one coordinating nestor partner (see Table 1).

The MoU [5] covers the following core points:

- partners agree to a mutual exchange of information on the subject of qualification in digital curation;
- partners agree to share teaching materials and mutually exchange experiences with their use;
- partners contribute to shared activities such as the development of curricular modules or the organization of training events in digital preservation;
- partners seek to increase the amount of digital preservation content in their respective curricula;
- in the long term, partners work together to establish a cooperatively conducted master’s course in digital preservation (see below).

Table 1: nestor MoU partner institutions

Cologne University of Applied Sciences, <a href="http://www.fbi.fh-koeln.de/en-index.htm">http://www.fbi.fh-koeln.de/en-index.htm</a>
Göttingen State and University Library (coordinating partner), <a href="http://www.sub.uni-goettingen.de/en">http://www.sub.uni-goettingen.de/en</a>
HTW Berlin University of Applied Sciences, <a href="http://www-en.htw-berlin.de">http://www-en.htw-berlin.de</a>
Humboldt-Universität zu Berlin, <a href="http://www.hu-berlin.de/">http://www.hu-berlin.de/</a>
Leipzig University of Applied Sciences, <a href="http://www.htwk-leipzig.de/en/">http://www.htwk-leipzig.de/en/</a>
Stuttgart Media University, <a href="http://www.hdm-stuttgart.de/english">http://www.hdm-stuttgart.de/english</a>
Stuttgart State Academy of Art and Design, <a href="http://www.abk-stuttgart.de">http://www.abk-stuttgart.de</a>
University of Applied Sciences Chur (Switzerland), <a href="http://www.htwchur.ch/en.html">http://www.htwchur.ch/en.html</a>
University of Applied Sciences Darmstadt, <a href="http://www.h-da.de">http://www.h-da.de</a>
University of Applied Sciences Potsdam, <a href="http://www.fh-potsdam.de/">http://www.fh-potsdam.de/</a>
Vienna University of Technology (Austria), <a href="http://www.tuwien.ac.at/en/tuwien_home/">http://www.tuwien.ac.at/en/tuwien_home/</a>
Archives School Marburg - University of Applied Studies for Archival Science, <a href="http://www.archivschule.de/">http://www.archivschule.de/</a>
GESIS – Leibniz-Institute for the Social Sciences, <a href="http://www.gesis.org/en">http://www.gesis.org/en</a>

Regarding the provision of training and distribution of digital curation knowledge, up to now the main activity of the nestor MoU-Group has been in four areas, with each of the channels targeting different audiences and needs:

- nestor seminars, targeting specialists and professionals in libraries, archives, and museums (LAM).
- nestor schools, targeting LAM specialists and professionals, students in library and information science (LIS), archival science, museology.
- Publications, targeting LAM specialists and professionals, students in LIS, archival science, museology.
- E-tutorials, targeting students in LIS, archival science, and museology.

nestor seminars are typically one day events and tend to address more specialized topics and audiences. Thus, in addition to introductory seminars on digital curation, events for example dealt

with specific digital preservation strategies and file formats (emulation as a means to preserving databases and electronic documents, PDF/A in digital preservation), standards (Open Archival Information Reference System), or metadata.

In contrast, nestor schools last three to five days and are geared towards a less specialized, more heterogeneous audience from different backgrounds and with varying levels of expertise. Since 2007, eight schools have taken place, reaching over 320 professionals from libraries, archives, museums, public administration and the private sector, as well as students in LIS, archival science, or museology courses. The didactic concept of the nestor schools combine presentations by renowned experts from the field with a strong emphasis on practical exercises and ample opportunity for discussion and networking.

In order to reach a yet wider community of experienced experts as well as beginners and students, the MoU-Group also coordinated the creation and publication of a comprehensive German-language introduction to digital preservation. The nestor Handbuch [6], published both in print and online, has been updated frequently and has meanwhile become a standard work in the German-speaking countries. In 2012 members of the MoU-Group coordinated a baseline study on the state of the art of digital curation of research data in Germany [7], [8]. An important aspect of this study was the evaluation of qualification issues in this special area of research data curation activities.

## Measures to reach the next generation of digital curators

Initial vocational training and education for future digital curation professionals is an important aspect of the work of the MoU-Group, which is predominantly composed of partners from the higher education sector, universities and universities of applied sciences (universities whose curricula emphasize practice-orientation) in particular. While students are also among the target audience for nestor schools and publications, the MoU-Group developed a concept for training exclusively aimed at students in LIS, archival science or museology degree courses. This concept was part of the effort to teach digital curation-related topics more frequently and in more depth. The outcome were a number of introductory e-tutorials created by students for students in supervised projects.

Tutorial conceptualization and development was initiated in 2007/2008 when a first set of e-tutorials was created by students under supervision of instructors in the respective degree courses. The topics initially covered included:

- An introduction to the preservation of digital objects
- File formats and storage media in digital preservation
- Preservation of specific data types (CAD, GIS)
- Metadata [9].

As the tutorials were to be used across the partnering institutions, a quality assurance procedure geared specifically towards the cooperative tutorial production process was implemented. It comprised measures to address quality before, during, and after the production process. These measures included, for example, introducing the students to the production platform (moodle [10]) as well as to the content, formal, and didactic framework of the tutorials; implementing feedback loops between

the production teams and the instructors in the different locations; evaluation of tutorials by users [11].

Overall, these user evaluations showed that the satisfaction with the tutorials was high. For example, a survey among students from three different years of a LIS master's course yielded very positive results for the tutorial "Introduction to the preservation of digital objects" created by students from Cologne University of Applied Sciences: 96% (n = 72) rated the understandability of the content as good or very good. 97% (n = 70) thought the subject expertise conveyed by the tutorial was good or very good. Students frequently remarked positively on the structure of the tutorial and the manner in which the content was presented (see Table 2). From the perspective of the MoU-Group, this is an indicator that the quality assurance procedures were effective. Critical statements about the tutorial in question tended to mention either the wish for a more in-depth discussion of selected topics, or expressed the wish for more practical examples or case studies in addition to the ones already included (see Table 3). Feedback of this kind served as valuable input for subsequent revisions of the tutorials.

**Table 2: Selected statements from e-tutorial evaluation (translated from German)**

Question: What did you particularly like about the tutorial (conception, theory/practice mix, etc.)?
"Understandable, well-portioned subject units"
"Clear structure and the possibility to test knowledge and understanding of questions straight away"
"Very good composition and structure, everything is comprehensible. . ."
"The conception of the content. The topic is presented in a manner that makes it possible to gain insights into the topic quickly. . ."
"Clearly laid out, comprehensible, introduction to the topic. . ."
"Composition and structure, conception"
"Very clear and well structured"
"Thematic structure, examples, illustrations, time frame for each of the modules"
"The structure: introduction followed by more specific topics, mixture between texts and tests. Makes it possible to test the leaning outcome right away"

**Table 3: Selected statements from e-tutorial evaluation (translated from German)**

Question: What did you not like about the tutorial? What was missing from your perspective?
"Overall it could have been a little more elaborate. . ."
"More in-depth discussion of some topics. . ."
"Practical experiences: which institutions implemented which preservation concepts with which means?"
"More differentiated description for a more in-depth introduction, also offered as downloadable PDFs."
"Yet more practical examples, more in-depth discussion of the specific requirements of digital preservation on libraries, archives, museums"
"More test questions. . ."
". . . include yet more practical examples"

Until now, the e-tutorials played a significant role in the teaching activities in initial vocational training for digital curation in the MoU-Group institutions. They provided an opportunity for self-study to students, but more importantly the supervised creation and revision of the tutorials was an important part of the teaching offers in MoU institutions. Despite of this, however, a recent evaluation carried out by the group showed some drawbacks of this approach. It is undisputed that the work on and with the tutorials produced very good learning outcomes as this approach succeeded in introducing students not only to a particular area of digital preservation but also allowed them to acquire skills in project management and the creation of online learning materials. However, notwithstanding these positive outcomes, the tutorials turned out to be very resource-intensive in their creation and maintenance. They were also somewhat inflexible when it came to the provision of teaching. Thus, mastering the “form” (a tutorial created with the online learning management system moodle) often took away considerable time from mastering the content. In addition, and particularly after the introduction of BA and MA degrees as part of the Bologna process, not all curricula of the involved partner institutions made it possible to fit a project of this scope into the courses. What is more, overall there seemed to be a stronger emphasis on the production of the tutorials rather than their use in the actual provision of teaching.

For the reasons outlined, the development and maintenance of the e-tutorials will no longer be a core activity of the MoU-Group in the future. Instead it was decided to build a shared online collection of teaching materials comprising, for example, lecture series, presentations, tools, bibliographies, and exercises for interactive training and education. Less resource-intensive in terms of development and maintenance, such a collection is more flexible in use and will make it easier to incorporate digital preservation content into the existing curricula. Like the e-tutorials, the collection of teaching materials will be realized using the moodle platform. The content will be organized thematically using the structure of the nestor handbook as a guideline.

## Towards a shared curriculum

The initial need to address the question of qualification for digital preservation in vocational training and education of future professionals in a nestor working group was made apparent by a survey investigating the coverage of digital preservation topics in existing and planned BA and MA courses offered by 16 HEIs in Germany, Austria, and Switzerland [12]. The survey revealed that only one course offer existed which explicitly addressed digital curation, and that otherwise (aspects of) digital curation were only covered in parts of lectures in some courses, however without being formally anchored in the curriculum.

Accordingly, from the outset, the members of the MoU-Group agreed to increase the digital preservation content in their curricula. A renewed overview compiled in 2012 showed that all partners now included a significant amount of digital curation content in relevant courses.

The initial survey carried out in 2006 also showed clearly that the partners of the nestor MoU-Group had different areas of expertise in the field of digital curation that were also reflected in the topics covered in their respective course offers [12].

Accordingly, rather than aiming to build parallel and competing offers attempting to cover the topic of digital preservation in all of its breadth and depth, the partners decided to cooperatively work towards developing a core curriculum for digital preservation education in the partnering schools and universities. The long-term objective is to establish a master’s course in digital preservation which is offered cooperatively by the involved partners. As explained above, this will be the fifth main area of activity of the MoU-Group.

The decision to create such a shared, cooperative curriculum was governed by the realization that none of the partners is capable of covering the entire topic of digital curation sufficiently, and that it is both more efficient and more beneficial to allow the involved partners to develop areas of expertise and specialization while at the same time promoting an active exchange of students and instructors.

Orientation on how to shape such a curriculum can, for example, be gained from analyses of job advertisements and of training needs in the area of digital curation, which shed light on the required skills and competences of digital curation professionals [1], [2], [13].

Both the analyses of job advertisements carried out by Kim, Warge, and Moen [13] and by the DigCurV project [2] found that the majority of advertisements looked for applicants with a master’s degree. The advertisements also suggest that employers look for a broad range of curation-related practical skills and experience (e.g. with curation-specific software tools) as well as a sound theoretical knowledge (e.g. of standards, and of metadata in particular) [2], [13].

Asked to specify training needs in their organizations, the respondents to the DigCurV survey [2] identified the following areas as most pressing: “General/basic knowledge of digital preservation issues (287, 64.5%), preservation and data management planning (285, 64.3%), preservation tools (263, 59.5%) and information modelling and metadata (230, 52.3%)” (p. 39).

Another valuable tool for curriculum development is the DigCurV curriculum framework [14], which defines digital curation skills sets for different professional roles (executives, managers, practitioners). Last not least the institutions forming the nestor network represent an important group of employers in need of digital curation professionals, and hence they can give valuable input concerning the requirements for (future) professionals in this field.

A first step towards the development of this shared curriculum is the above-mentioned shared platform of digital preservation teaching materials, which will be a good point of departure to discuss the curriculum from a new perspective and on a new basis. In addition and as a desired side effect, peer-based discussions on quality and comparability of didactical approaches and the levels of competence addressed will improve and enhance the cooperation of the MoU-Group.

## References

- [1] L. Jahnke, A. Asher, and S. D. C. Keralis, The Problem of Data. (CLIR, 2012), Retrieved from <http://www.clir.org/pubs/reports/pub154/pub154.pdf>
- [2] C. Engelhardt, S. Strathmann, and K. McCadden, DigCurV: Report and Analysis of the Survey of Training Needs (2012), Retrieved from

- <http://www.digcur-education.org/eng/Resources/Report-and-analysis-on-the-training-needs-survey>
- [3] nestor Homepage, Retrieved from <http://www.langzeitarchivierung.de/Subsites/nestor/EN>
- [4] nestor MoU-Group Homepage, Retrieved from <http://nestor.sub.uni-goettingen.de/education/index.php?lang=en>.
- [5] nestor Memorandum of Understanding: Kooperative Entwicklung curricularer Module zur digitalen Langzeitarchivierung im Rahmen des Arbeitspaketes 5 - Bildung/Veranstaltungen des nestor Kooperationsverbundes, Retrieved from <http://nestor.sub.uni-goettingen.de/education/mou2011.pdf>
- [6] H. Neuroth, A. Oßwald, R. Scheffel, S. Strathmann, and K. Huth (eds.), nestor-Handbuch: Eine kleine Enzyklopädie der digitalen Langzeitarchivierung, Version 2.3 (2010), Retrieved from <http://nestor.sub.uni-goettingen.de/handbuch/index.php>
- [7] H. Neuroth, S. Strathmann, A. Oßwald, and J. Ludwig (eds.), Digital Curation of Research Data. Experiences of a Baseline Study in Germany, (Glückstadt, 2013)
- [8] H. Neuroth, S. Strathmann, A. Oßwald, R. Scheffel, J. Klump, and J. Ludwig (eds.), Langzeitarchivierung von Forschungsdaten. Eine Bestandsaufnahme (Boizenburg, 2012)
- [9] R. Scheffel, A. Oßwald, H. Neuroth, "Qualifizierung im Themenbereich Langzeitarchivierung digitaler Objekte", nestor Handbuch, Version 2.3 (2010)
- [10] moodle Homepage, Retrieved from <http://www.moodle.de>
- [11] A. Oßwald, D. Otto, and N. Stettler, "Qualitätssicherungsstrategie für kooperativ erstellte E-Learning-Kurse: Entwicklung einer iterativen Strategie am Beispiel der nestor-initiierten E-Tutorials zum Thema Langzeitarchivierung digitaler Objekte", In: R. Kuhlen (ed.), Information: Droge, Ware oder Commons? Wertschöpfungs- und Transformationsprozesse auf den Informationsmärkten (Boizenburg, 2009)
- [12] A. Oßwald, R. Scheffel, "Lernen und weitergeben - Aus- und Weiterbildungsangebote zur Langzeitarchivierung", In: nestor – Handbuch, Version 1.2 (2008), Retrieved from [http://nestor.sub.uni-goettingen.de/handbuch/artikel/nestor\\_handbuch\\_artikel\\_141.pdf](http://nestor.sub.uni-goettingen.de/handbuch/artikel/nestor_handbuch_artikel_141.pdf)
- [13] J. Kim, E. Warga, and W. Moen, "Competencies Required for Digital Curation: An Analysis of Job Advertisements" IJDC, 8, 1 (2013), Retrieved from <http://www.ijdc.net/index.php/ijdc/article/view/242>
- [14] DigCurV, A Curriculum Framework for Digital Curation (2013), Retrieved from <http://www.digcurv.gla.ac.uk/>

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