

DIGITAL HISTORY EDUCATION FOR PUPILS. FIRST STEPS TOWARDS A TEACHING LEARNING LAB.

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ABSTRACT:

This paper explores digital education for pupils in a humanities teaching-learning lab. So far, digital humanities educational approaches have been primarily aimed at students. Teaching-learning labs, in which students design, implement and evaluate teaching offers for pupils, have so far almost exclusively existed in STEM subjects.

Based on a classification in European frameworks and a literature analysis on teaching-learning labs of digital history education, the current state of the art on the topic is elucidated. Using concrete practical examples, the first results of involving students in digital history projects will be presented and suitable digital tools for teaching humanities content will be introduced.

1. INTRODUCTION¹

Digital literacy and technologies are becoming increasingly important not only in higher education teaching, but also in lifelong learning (European Commission, 2017, 2019). Currently, most courses in the field of digital humanities are aimed at students at universities (Muenster et al., 2021) or in vocational training programs. Educational opportunities for pupils on this topic are currently primarily covered by non-school institutions such as museums and libraries. There are almost no student research labs in the areas of digital humanities and digital heritage. These are almost exclusively in the STEM area.²

The goal of this paper is to (a) survey frameworks for digital education in the humanities (b) present the current state of teaching labs in the field of digital history, and (c) exhibit initial results of establishing a digital history lab and engaging pupils in digital history projects. A particular focus will be placed on digital tools that are deemed suitable for teaching humanities content.

2. CURRENT STATE OF EDUCATIONAL PROGRAMS IN DIGITAL HUMANITIES AND CULTURAL HERITAGE

Globally, Digital Cultural Heritage (DCH) is an emerging field. Cultural heritage refers to traces and expressions from the past that have lasting value in contemporary society (UNESCO, 1989). It traditionally focuses on tangible objects, but a broader understanding that incorporates intangible heritage and computer-based material has gained significance over the last decade. Digital heritage, technically intangible, comprises resources of human knowledge or expression (e.g., cultural, educational, scientific) as well as cultural heritage materials including texts or images which are created digitally or converted into digital form (UNESCO, 2018). Although there are many university programs and courses focusing on DCH, there is no comprehensive overview of programs. One reason may be that many study courses are driven by traditional fields such as digital

archaeology, digital curation or digital conservation as well as related areas as digital humanities (DH) (Münster et al., 2019). Educational programmes for DCH vary at international, national and local levels. Concrete efforts are therefore being made at EU level to formulate core curricula and competence frameworks.

2.1 Core curricula and competency frameworks

Core curricula as an overarching body of knowledge and competencies in a specific domain sum up conditions for learners, learning processes as well as outcomes and therefore define requirements for education. They record competencies for students in several sectors (subject-specific, social, etc.) and show the content of modules and their objectives. Furthermore, they point out organizational aspects and offer methods for university lecturers to design courses that achieve the desired learning outcomes. These outcomes include appropriate digitization processes related to teaching, learning, and curriculum development. Within DH and DCH, emerging methodological and technical changes continue to greatly impact the development of core curricula (Schulz, 2018). In particular, the wide array of digitization techniques require transformations not only in digital content but also in teaching digital pedagogy and curricular-based digital skills (Grünwald, 2020).

Competency Frameworks provide agreed definitions, descriptions, and implementation methods according to the demands, standards, and guidelines of specific sectors (Corr et al., 2019). The DigComp framework (European Commission, 2019) considers digital literacy as a critical, future skill for citizens. Frameworks that include recommendations for educators are for instance the digital literacy framework (JISC, 2014) that addresses university-educators in the Anglo-Saxon world and covers media literacy, communications and collaboration, professional engagement, digital resources, teaching and learning, assessment, empowering learners, and facilitating learners' digital competency, ICT-literacy, learning skills, formal and informal digital-scholarship and information literacy (Eichhorn et al., 2017).

¹ Parts of this article has been published in (Muenster, 2021) und (Muenster, 2023).

² Date of the last Google research: 02.06.2023.

2.2 Educational programs in Digital Humanities

Syllabi and core topics in DH are mostly analyzed on university level. Sahle designates digital society, culture and science (1), special research field areas (2), theories, methods and questions addressing them (3), digital transformation and tools (4) as well as resources for single research fields as main areas of study programs (Sahle, 2013). Sula et al. specify more precisely topics like enrichment, capture, and storage as prevalent in European analysis, meta-activities such as project management and creation (designing, programming, writing) as special features in anglophone programs (Sula et al., 2017). These approaches also mention the significance of teaching content, methods, and skills in combination with practical formats like case-studies, projects, evaluation (Sahle, 2013) or project-based-learning (Kröber and Münster, 2014).

3. THE DIGITAL LABORATORY APPROACH IN SCHOOL EDUCATION ON HUMANITIES

3.1 Digital Cultural Heritage education in schools

Since the previously mentioned frameworks primarily target university students and postgraduate education, school education is currently predominantly targeted by heritage institutions, although the European Heritage Strategy for the 21st century (Council of Europe, 2018) mentions the demand to incorporate heritage education into school curricula. For the teaching of history, teaching-learning laboratories open up the possibility of combining school and university education. Here, students in teacher training degrees can develop, implement and reflect on their own digitally-supported teaching offers of historical learning for pupils and thus be motivated and empowered to use digital tools in history teaching.

3.2 Results of a literature review

A current state of student laboratories in DH was studied via a keyword-based survey in 10/2022 via Google Scholar.³ The filter-based investigation was limited to German-language published between 2012-2022. The search initially revealed 200 articles, 15 of which dealt with digital history education and has been selected for further analysis. For those articles a qualitative content analysis based on Mayring (Mayring, 2000) was conducted.

As preliminary results, teaching-learning labs have so far been located primarily in STEM fields. Increasingly, they are also establishing themselves in the humanities and social sciences. This innovative teaching concept is defined as follows: "Student teachers develop theory-based learning opportunities (...) in a (university) teaching-learning lab seminar, which are then tested, reflected upon, revised, and retested with students in the university classroom." (Rehfeldt, 2018, p. 94)

The interdisciplinary topic of history and digital learning has been virtually inexistent in the German-speaking world so far. Due to the rapid digital change, however, the integration of the teaching of digital competencies is also considered necessary in history didactics. "As public historical culture becomes increasingly digitally professionalized in the form of press articles (...) and, yes, even school-based teaching and learning materials, enabling and promoting "digital" (...) historical research, interpretation, communication, and presentation skills becomes a central task of any history course." (Demantowsky,

2015, p. 137) sees potential in the reception and production of digital media. Both the expansion of the learning space through the internet, the multimedia forms of presentation, possibilities of mobile, but also self-directed and cooperative learning play a role. Increased subject-oriented learning promotes the development of an individual awareness of history. Collaborative learning formats, on the other hand, provide insight into the construct character of historical narratives and the discursivity of historical interpretations (Demantowsky, 2015).

Teaching-learning labs with a focus on learning history using digital media have not yet been established or investigated as a research topic in the German-speaking world. Only 1 of 15 relevant publications is dedicated to this topic (Klein, 2021). Similarly, only one publication on labs with a focus on digital learning was identified, with learning workshops highlighted in this context as a didactic alternative to digital learning in the classroom (Wiater, 2007).

A few publications (3/15) are dedicated to the subject of professionalizing prospective history teachers in teaching-learning labs with a purely history didactic topic (Rehfeldt, 2017, 2018; Seibert, 2020). In Rehfeldt's case, mainly interdisciplinary effects of already conducted teaching-learning lab seminars were investigated and adapted for the subjects English, and history. Somewhat more detailed research is devoted to digital history didactics (4/15). Digital history didactics is thereby defined as "(...) integral part of history didactics and deals with the conditions and effects of digital change on historical consciousness, historical learning, history and memory culture" described [26]. In this context, digital historical offers are primarily examined as a learning occasion, location, or object in history classes and a case is made for the use of digital media in teacher training and continuing education (Alavi and 2015; Bernsen, 2012; Kühberger, 2015; Leinung, 2021).

The topical focus of the publications examined was on learning history using digital media (6/15), whereby the emphasis was on the one hand on the influence of the digital transformation on learning history and on the other hand on opportunities and challenges in the use of digital media in history-related teaching and learning. The use of virtual and augmented reality technologies was discussed in more detail (Bellingradt and Heise, 2022; Demantowsky, 2015; Lewers, 2022; Pallaske, 2015; Pätzold, 2021).

Conditions for the success of a teaching-learning lab are mentioned by Seibert and Wiater. They investigated whether teaching-learning labs contribute to improving teacher training at a university and which pre-professional competencies are acquired. For them, research that accompanies practice plays a role, as does the close integration of theory, practical implementation and reflection. In the protected setting of the teaching-learning lab, students can test themselves and develop teaching-specific competencies. Regular feedback from the teachers provides them with a realistic self-image (Seibert, 2019). Wiater sees an opportunity above all in the fact that teaching-learning labs are extracurricular institutions and thus independent of curriculum and grading. Hence, they create a fault-tolerant, motivating, and anxiety-free learning environment without pressure to perform or compete. In the teaching-learning lab, the individual abilities, knowledge and interests of the learners can be addressed and opportunities for independent learning, planning and reflection can be created. Individual learning needs, learning goals and progress are recorded and made visible.

³ Keywords: History didactics, history learning, digital, digital media, teaching-learning labs.

Students are accompanied by tutors who support and guide them and prevent them from being overwhelmed (Wiater, 2020).

4. THE JENA DIGITAL HISTORY LAB

4.1 Testing digital laboratories in the humanities with the DH Lab



Figure 1. A student presents her digital project to pupils

In order to test and establish digital labs in the humanities, the DH Lab, funded by the Stiftung für Innovation in der Hochschullehre, started in 2022 at the University of Jena, involving the departments of Digital Humanities and Didactics of History as well as the Thuringian State Library. The teaching-learning lab involves students of history teaching to develop digital history lessons and to test and reflect on them with pupils in class as well as in the context of extracurricular activities (cf. Fig. 1) In the process, the prospective teachers gain practical experience in teaching cultural heritage, which they can build on in their later professional lives. The focus is on Jena's city history and is intended to motivate the children and young people to deal with the cultural heritage, famous personalities and historical events of their hometown in a creative way. To this end, a range of digital methods are used, for example to create virtual city tours, 3D Scan historical everyday objects or interview contemporary witnesses. The first results of the project are three courses designed by students of art history and history teaching, which will be offered once a week as an extracurricular workshop for pupils in grades 5-10 within the framework of the DH Lab over a period of six weeks.

4.2 Methods and tools used in the DH Lab

To prepare the teaching students, a pool of easy-to-apply digital methods and tools was curated and discussed (cf. 4.3 Collection of tools for digital intermediation). These methods and tools are intended to enhance the learning experience of historical topics and allow for the development of digital literacy skills without basing a significant part of the teaching solely on the use and understanding of a particular digital tool.

The chosen methods and tools are, for example: (a) oral history as methodical field (cf. Table 2), (b) digitalizing historical objects into 3D environment (cf. Table 3), (c) transferring the method of historical timelining into a digital and interactive setting, and (d) curating information for web publication and the creation of virtual city tours (cf. Table 4).

(1) Tell us, what it was like: oral history project

Eyewitness accounts are often the most authentic way to immerse oneself in history. The goal of this project is to provide students with the necessary skills to create these oral history contributions. We create articles about the history of the GDR, including its impact on younger generations. The students

learn about the various digital tools and how to use them, delve into legal issues surrounding oral history, and receive support in creating, editing, and using the contributions.

Table 2: Description of the oral history project

With oral history as methodical field both students and pupils are supposed to learn about a specific research field of history that requires a certain level of media competence. In addition to the technical skills, the access to the field of oral history is meant to be a base for the improvement of certain media literacy skills, such as the ability to evaluate recorded information and the understanding under which parameters such information can be gained, edited or even manipulated.

(2) Objects tell stories: we listen

What does a microwave have to do with history? Can I learn anything about earlier life from the tools in the barn? What furniture did the inhabitants of our town own a hundred years ago?

The big and small events of the past are not only found in old books. History surrounds and encounters us every day. We only have to be prepared to see and hear these stories.

Together, we look for objects and try to decipher what we can learn about history through them. By making 3D scans of the treasures we find, we want to take a close look at them and learn how to work freely in an exploratory way.

Table 3. Description of the 3d digitization project

The digitalizing of historical objects is already a big part of cultural digitalization. In choosing this field and providing access to low-threshold applications for 3D digitalization, students and especially pupils gain access to a vital scientific field which allows them to participate in historical science without taking part in advanced studies (cf. Fig. 2). This is a high motivational factor for the pupils and allows research-based learning with digital methods. On the basis of the digitalized objects insights into the questions of how to engage with digitalized history are to be discussed with the pupils. Furthermore, digital literacy skills concerning the understanding of digital objects can be obtained.



Figure 2. 3D scan of the miniature version of a monument

By transferring the method of historical timelining into a digital and interactive setting all benefits of analog timelines to convey historical correlations are maintained. Information is clearly arranged and therefore easier to interpret and study. By enhancing that method with digital media, e.g. images or video, pupils are allowed to engage with a field that they are native to and are therefore expected to be increasingly motivated (European Commission, 2019). The future teachers on the other hand are to learn how to sensibly enhance their already known analog toolkit with digital media.

There are already some providers for timelining applications that can be used. In addition, learning how to gain and evaluate information from digital sources can be easily discussed on the basis of the chosen material thus providing additional strengthening of digital literacy.

(3) Culture of remembrance rethought: digitization of Stolpersteine

We see them regularly on our way to school, when we meet friends in town or when we go for a walk with our eyes open: *Stolpersteine*. They are memorial stones that remind us of the people who were persecuted, deported and murdered under National Socialism. In this course, they are brought into the digital world. On 4dcity.org, pupils list the locations on a virtual city map, learn about the stories of the people behind the *Stolpersteine*, and tell their stories through own texts that are later published on the website.

Table 4: Description of The Stolpersteine digitization project

The conversion of information for web publication and the creation of virtual city tours may, strictly speaking, not be a method or tool, but rather a place to convey central aspects of digital literacy. It can be closely connected to other tools – in our case a 4D mobile browser application provided by the department of Digital Humanities. The pupils learn how to process information on the internet and how to create their own educating content for cultural heritage. By implementing their content into the browser application they also gain access to participating in the digital preservation of culture and history. Similar to the enhancing to historical timelining, the pupils are able to engage with a field they are already familiar with an gain more competence in terms of digital literacy.

4.3 Collection of tools for digital intermediation

Although the previously discussed methods where those the teaching students deemed suitable for their individually chosen historical topics, a larger array of tools and applications were collected and might be additionally used in the future, depending on different historical topics and the necessities of the chosen target groups in pupils (cf. Table 5).

The collected tools were critically discussed and examined by the prospective teachers. For their final decision on what tools and methods to use, four questions were addressed: (a) what their intermediation would be aiming at, (b) which tools could be used accordingly and would be conducive to the chosen topics, (c) which tools would be sensible for the target group, having age and level of education in mind, and (d) what aspects of digital literacy and media literacy could be additionally taught, keeping the DigComp framework (European Commission, 2019) in mind. Moreover, only tools with no commercial status, mainly provided by state or educational institutes were taken into consideration to ensure scientific and educational independency.

Tool and availability	Application	Category
4DCity (Jena 4D group, 2023)	- digitally enhanced city tours for Dresden and Jena with 4D points of interest (POIs) - collection of historical images in direct comparison to the modern surroundings - possibility for participation via activities to re-take historical images or upload own images - browser application for mobile devices	participatory explorative visually
3D Heritage (Jena 4D group, 2022)	- a collection of 3D models of cultural assets - possibility to take part in the process of the digitalisation of cultural assets via smartphone - browser application for mobile devices	participatory visually
Kultur Zuhause (Room AG, 2020)	- collection of 3D-tours of museums, castles and other cultural monuments (predominantly in Thuringia, Germany) - browser application	visually explorative
Old Maps Online (Klokan Technologies GmbH, 2022)	- extensive collection of historical maps - including tools to compare and georeferenced historical maps and modern maps - browser application - available as software application	visually explorative
TimeMapper (Open Knowledge Foundation Labs, 2013)	- tool to create interactive maps - possibility to include timelines and secondary information about historical topics - usage is supported by video tutorials - browser application	participatory visually
StoryMap JS (Northwestern University KnightLab, 2019)	- tool for the creation of interactive maps with focusing on the progression of time and storytelling aspects	participatory visually

Tool and availability	Application	Category
	<ul style="list-style-type: none"> - the implementation of different media types is possible to enhance the map - usage is supported by video tutorials - browser application 	
Timeline JS (Northwestern University KnightLab, 2020)	<ul style="list-style-type: none"> - tool to create digitally enhanced timelines - usage is supported by video tutorials - browser application 	participatory visually
Oral History Toolkit (Vo Dang et al., 2015)	<ul style="list-style-type: none"> - collection of guidelines and support content for the creation of oral history projects aimed at students, pupils, and citizen science - online repository 	repository participatory
Soundcite JS (Northwestern University KnightLab, 2014)	<ul style="list-style-type: none"> - low-threshold tool to embed audio tracks into digitally presented, written content - a Plug-in for Wordpress is available - browser application 	participatory
ForText Toolkit (Gius et al., 2016)	<ul style="list-style-type: none"> - curated collection of tools and methods to create digital editions - guideline for best practice in the field of digital editions - mostly aimed at university students or similar levels of education - online repository 	repository

Table 5. Collected tools for digital intermediation of historical topics

All of the presented tools are available free of charge and are usable with almost no prior knowledge, which means that they are suitable for a wider audience, e.g. younger pupils. Nevertheless, they are highly versatile in terms of the desired output.

4.4 Next steps for the DH Lab

As a first result of the project, three courses introducing methods and tools were designed by the students. Each course centers around a different method or tool and an individually chosen historical topic. Those topics are: German *Stolpersteine*, commemorating the victims of Nazi persecution, historical everyday objects and their value as historical sources and June 17, 1953 youth culture in the DDR.

The DH Lab courses are currently offered once a week over a period of six weeks as an extracurricular workshop for pupils in grades 5-10.

The next steps of the project are the practical implementation on a regular base, evaluation, and the revision of the courses as well as the used methods and tools. Therefore, the learning experience of both students and pupils will be closely examined. In addition, the gathered materials will be made available on a publicly accessible platform.

Research topics of the Teaching-Learning-Lab will be focussing on the scientific monitoring of the development of digital competencies of students and pupils, the investigation of suitable teaching concepts when using digital tools and possibilities of a long-term establishment of Teaching-Learning-Labs in the field of Digital Humanities.

4.5 Preliminary project with elementary school children: Creation of virtual city tours of churches in Jena

First experiences in the field of digital history teaching were gained in an elementary school project on the topic "Churches of our city", which was conducted in June 2022 with five pupils of the 3rd and six pupils of the 4th grade. Working with the computer was a highly motivating factor. In addition, the personal connection to the local churches and the creative approach, motivated the pupils to deal with the city's history. However, internet research, especially filtering out credible sources and formulating the most important information about a topic proved to be difficult to them. This was in line with the identified problems of the DigComp framework (European Commission, 2019) and proves that this skill would have to be learned in the future either in preliminary course or accompanied by tutors.

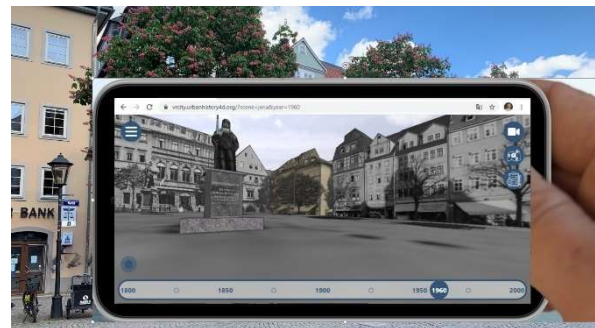


Figure 3. Screenshot of the 4D mobile browser application with pupils' contributions

Building on the identification and reproduction of this problem, all our DH Labs discussed methods and tools that allow the learning of media literacy and digital literacy focusing on understanding and evaluating information.

5. CONCLUSIONS AND PERSPECTIVES

The focus of the analysis so far has been on the review of literature dealing with digital history learning in the context of teaching, especially of teaching-learning labs, and the implementation of the DH Lab.

A next step would be an analysis of the conditions for success of long-tested STEM student labs and the possibilities of a transfer to a learning lab in the humanities. For example, the chances and limits of interdisciplinary cooperation in the scientific monitoring of teaching-learning labs as well as concepts for long-term funding and establishment could be investigated and compared.

To be able to implement methodological and content-related ideas without technical barriers, it will be inevitable to learn what technical equipment and introductory courses are required for handling digital tools in teaching-learning labs with a digital and cultural focus. In addition, the evaluation of the learning experience with different methods and tools for both the students and pupils would be an essential next step to gain more insights. Since a larger selection of methods and tools was discussed with the prospective teachers, there is also room for modifications within the DH Labs current approach.

Moreover, the curation and analysis of a bigger pool of methods and tools suitable for a low-threshold integration in digital teaching and learning should be investigated. Closely connected to this, would also be the practical question about what pupils and teachers are expecting from working with digital methods and tools. Also, opportunities and limitations of the focus on regional history could be investigated and compared with other thematic foci. Furthermore, only German-language articles have been evaluated so far; a next important step would be to analyse publications in English-speaking countries and their experiences with teaching-learning labs in the field of DH.

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