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Stefan Kessler and Christina Rothen

**Pro-amateur information space:
www.bildungsgeschichte.ch**

The paper discusses the possibilities and prospects of a disciplinary search portal for sources and data on the history of education in Switzerland called “Bildungsgeschichte Schweiz” (www.bildungsgeschichte.ch). The open-access and multilingual portal offers a combined full-text and metadata search of historic holdings from different collections and providers. In the context of increasing digitisation and public accessibility of historical materials and the ongoing digital transformation of the humanities, the goal is to create a user-friendly “information space” for researchers and non-researchers alike. The paper focuses on the ideas behind building up this information space and on the possibilities that are given with the application of a search function to a large and diverse data basis. Particular attention is paid to the reuse of research data in the light of current open research data strategies.

1 New technologies, new inputs, new criticism

Recently, the digital transformation in the humanities brought up many questions regarding the conditions under which (historical) knowledge is, was, and even will be produced, communicated, and preserved. A turn towards an increasing awareness of the “digital” in historical research is reflected in terms such as “Digital history” (Cohen & Rosenzweig 2006), “Digitale Geschichtswissenschaft” (Schmale 2010) or “E-History” (Schaser 2006). Following the “digital humanities” discussion, digitalisation is ascribed a catalytic function on at least three levels: That is (1) the technical-material properties of the information and communication technologies for research, (2) the research objects, materials and artefacts, and (3) the methods, practices and social contexts in knowledge production, communication and preservation (Berry & Fagerjord 2017; Stehr & Adolf 2018). Thus, whether it is the methods and tools, the research infrastructures, or the specific representational forms of knowledge and information, digitalisation is generally regarded to impact how we research the past.

Digitalisation also brings new opportunities for the access to different types of sources and resources. Nowadays, more and more printed texts, manuscripts,

pictures, drawings or other objects are represented in digital collections, online archives or repositories maintained by memory institutions and research cooperatives. In addition, research data is becoming increasingly accessible and open for reuse as a result of Open Research Data (ORD) strategies by funding organisations and the establishment of dedicated research data management (RDM) services and facilities at research institutions. Digital infrastructures have played an important role in this context, not only in the ways of producing, storing, processing or archiving of these data, but also for their distribution and management as well as the knowledge created or made accessible. Memory institutions are changing the focus away from simply preserving towards actively offering information (Döhl 2019). Today's easy and open access to digital collections and repositories offers new opportunities to engage with the past. In combination with technological innovations that provide huge data storage capabilities, fast data retrieval and new full-text search possibilities and that enable the linking of different as well as very large data collections, this access dynamically opens the "information space" (Haber 2011). We can see a transformation in the practices, but also in the social and material conditions of research and the infrastructures facilitating research (e.g. Vinck & Natale 2015). The digital data ecology that is emerging as a quasi by-product is at once the result and lays an essential basis of subsequent research in the humanities.¹

With the increased access to historic holdings, however, new questions regarding source criticism arise. There is agreement in the current debate that people-independent evaluation of historic holdings is illusory. Formulating precise research questions as well as searching, selecting, and contextualising sources and data are still relevant as a part of the researcher's work even in an increasingly digitised research environment (Föhr 2018; see also the topical debate in *Bildungsgeschichte–IJHE*, 5(1) 2015). Digital source-criticism is particularly relevant with regard to questions such as what kind of sources are actually generated for digital access and whether new hierarchies according to the degree of their digital accessibility and usability are emerging (Döhl 2018). The same applies to data infrastructures for research, which are not neutral in the way they re-present data and may influence the production and use of data from a design and performance perspective (Hartong et al. 2020).

With regard to data infrastructures, there are concerns about too high expectations, given how many attempts have failed in providing long-term access to humanities data via the web. A recent article in the *Neue Zürcher Zeitung*, for example, scandalized the high quota of expensive IT projects for the humanities, which have been discontinued or are fading away (Hafner 2021). Several projects costing millions of Swiss francs are mentioned that are or were thought to be

¹ See also Döhl (2018, 313ff.) for a further discussion on this dual effect of digital archives.

stored and made searchable – and that were either shut down or transferred to other platforms. Some of the large projects in the digital humanities failed due to excessive source-critical requirements or communication difficulties between researchers and technologists. As the author of the aforementioned article points out, smaller projects, which cleverly balance opportunities and limits, have often been more successful than large, expensive and not easily maintainable projects. Regarding the latter we can generally see that many platforms do not continue to operate after a project ends, while others are migrated to other platforms or even archived themselves. For example, the project *Swiss Electronic Library (Elektronische Bibliothek Schweiz)*, which has been promoted as the main platform for the access to possibly all relevant holdings from different library and archive databases in Switzerland, was closed in 2015 and is now an archived website.²

Nevertheless, at least two interdisciplinary information spaces have successfully managed to hold their own in the last two decades and are also extensively used in the humanities. Although hardly anyone admits this in public, Wikipedia and Google have become established tools in the field of history for their lexical approach and the search possibilities among a vast – yet not universal (Haber 2013) – collection of online (re)sources. While these are generally regarded and valued as non-academic (i. e., not-too-much-to-be-trusted) search resources, they are predominant in many researchers' discovery search (Antonijević 2020). Furthermore, Wikipedia is a good example of how sharing and creating knowledge might go hand in hand in an increasingly digital research landscape in which many interested parties, amateurs and experts alike, engage by exchanging ideas and creating new knowledge. This collective form of interaction has also been called the "pro-amateur revolution". Basically, the term describes a collective form of interaction in which many interested (amateurs and experts) contribute to a platform to engage with exchanging ideas and creating new knowledge (Koller 2016, 76).³

2 Bildungsgeschichte Schweiz – the portal

Since June 2018, the knowledge portal *Bildungsgeschichte Schweiz/History of Education Switzerland* (www.bildungsgeschichte.ch) collects publicly available digital sources related to Swiss educational history and makes them searchable through a

2 For a description of the project see http://e-lib.ethz.ch/index_EN.php (accessed 08.10.2021). The archived website can be accessed at <http://e-lib.ethz.ch/copy/en/index.html> (accessed 08.10.2021).

3 Wikipedia is probably the most often cited example of a pro-am revolution, which challenges not only established ways of knowledge preservation but also the way of how knowledge is being consumed and communicated. The example of Wikipedia also shows that in some contexts of information-sharing no formal distinction is made between experts and amateurs. Of course, professional and authoritative knowledge (and thus prestige) play an indirect role, as is also known from the non-historical literature (Leadbeater & Miller 2004, 23).

multilingual search interface (see figure 1). The portal, which is also a finding tool for research data, enables researchers, students, teachers and interested members of the public to carry out discipline-specific research on sources and data relating to the history of education. By doing so, the portal contributes to the so-called “pro-amateur revolution” (Koller 2016), which progresses with the digitalisation of society and research.⁴ The idea behind this portal is to link publicly available sources and data from different places via one platform and thus to make data that are sometimes difficult to access or are little-known easier for anyone to access. With the digital accessibility it is, for example, no longer necessary to visit the archive to explore past spaces and times. As the portal is open to anyone, it bears the potential for new ways of engagement with historical material for researchers and non-researchers alike. In addition, more and more researchers share their data for reuse. By gathering these data on one platform and making them searchable, there is a potential to expand the digital information space for researching the past.

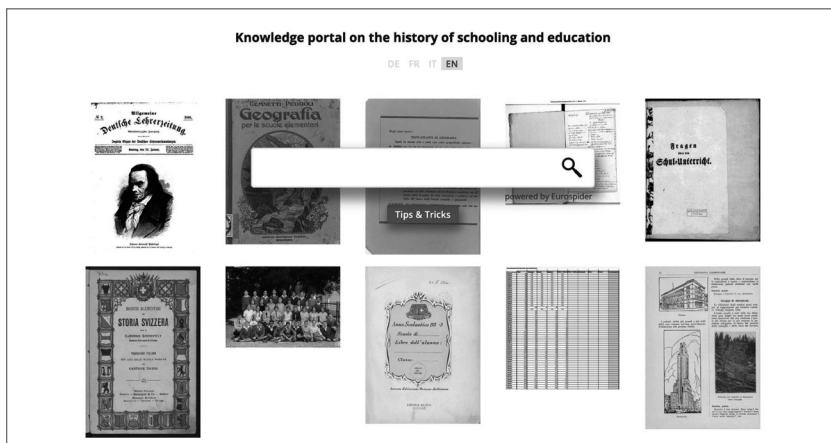


Fig. 1: Homepage of the search engine *Bildungsgeschichte Schweiz* with a multi-language user interface

Why easy access and why yet another infrastructure? As a matter of fact, most of today’s digitally-available sources are accessible through databases; some of them are even full-text searchable. The problem is that they are scattered across different platforms, repositories, and databases with sometimes limited information retrieval capability and interconnectedness. This situation makes it difficult to find or even know about relevant sources and data in the history of education.

⁴ In our case, the platform is not designed to actually allow direct interactions in order to create new knowledge, but has several features with a pro-am in common: The platform is open to anyone, it is simple and intuitive to use and allows also the non-researcher to engage with educational history.

The same applies for research data. Today, a plethora of general, institutional and discipline-specific repositories already exists in which researchers can deposit their data – all of these have very different requirements on the data to be deposited, use different standards with respect to storing and metadata and are accessible to varying degrees via library catalogues and project databases. From the user's perspective, this variety can be perceived as problematic (Kullik et al. 2017). For this reason, *Bildungsgeschichte Schweiz* continuously adds publicly available sources and data related to the history of education into its search engine. The portal addresses the need from individuals but also from institutions active in the field of research, collection and dissemination of historic holdings regarding the findability and reusability of these resources.

Bildungsgeschichte Schweiz can be best described as a content-oriented “scientific search engine” (Gantert 2011, 189) with a specific disciplinary focus.⁵ Thus, the search is the heart and the soul of the portal. The search engine has been developed by *Eurospider Information Technology*.⁶ The developer brings a lot of know-how in the construction of specific search engines. Since Eurospider has, so far, mainly built solutions for banks and forensic applications, the company is interested in demonstrating its know-how on a public corpus of sources. This win-win situation makes a high-quality technical solution affordable. Although the search engine working in the background is state of the art, the infrastructure retains its accessibility to the user and is easy to use and understand. The search engine of www.bildungsgeschichte.ch uses both the full text and the metadata as a finding tool. Queries can be entered through a single search slot on the homepage or by using a second query line in the advanced search mode (see figure 2). Searches can be limited to specific segments of a text (i. e., search only in the title or in the body of the text), to specific metadata or be further specified using common search operators or phrase search. A documentation of these possibilities is presented in a dedicated “Tips and Tricks” section. While specific searches can be done, an ‘empty search’ results in an overview of all collections currently integrated in the engine.

The front-end of the search engine is currently being re-implemented. A mock-up version of the new search front-end is shown in figure 2. Already in the current version, the search can be structured and narrowed down with facets that correspond to the inventories as well as the specific technical and content-related attributes of the data included. In the list of results, a text snippet is presented for each document that shows the detected passage in context. The inventories can be selected or deselected according to preference in order to pursue a more in-depth search using the facets. A login provides the ability to assign search hits with indi-

5 For example, within the *Swiss portal for the historical sciences (infoclio.ch)*, *Bildungsgeschichte Schweiz* is listed as a “thematic portal” in the online resources section: <https://www.infoclio.ch/en/node/130229> (accessed 08.10.2021).

6 <https://www.eurospider.com/en/relevancy-product/mcs-search-solution> (accessed 08.10.2021).

vidual tags, for example, to create targeted folders for specific searches and access them at a later date. In contrast to the current version, there will also be a page view that displays the document as well as the associated metadata (and individual tags) in a separate window.

The screenshot shows a web interface for 'History of Education Switzerland'. At the top, there are navigation tabs: 'Startseite', 'Bestände', 'Tipps&Tricks', 'Rechtliche Hinweise', 'Verein', and 'Anmelden'. Below the navigation is a search bar with the query 'Lob und Tabel' and a search button. The results show '1 - 3 of 324824 results found for "Lob und Tabel"'. Two results are displayed:

Universal-Lexicon der Erziehungs- und Unterrichtslehre für ältere und jüngere christliche Volksschullehrer - 1 (1840)

Author	1840	Inventory/Project	Scriptura Paedagogica Online
Period of reference	Schlosser	Publication date	Bibliothek für Bildungsgeschichtliche Forschung Berlin
Editor	German	1840	
Language		Transcription	Open (OCR)

Gymnasium : Zeitschrift für Lehrer an Gymnasien und verwandten Unterrichtsanstalten - 13.1895

Author	1850	Inventory/Project	Scriptura Paedagogica Online
Period of reference	Schlosser	Publication date	Bibliothek für Bildungsgeschichtliche Forschung Berlin
Editor	German	1850	
Language		Transcription	Open (OCR)

Fig. 2: Result page view of *Bildungsgeschichte Schweiz* (mock-up version of the new search front-end)

The end user must still interpret the context of the source or document, however. For this purpose, a link to the original inventory or project is included for further orientation. It is not the aim to make other information resources obsolete, but to provide an easy and intuitive entry into the collected resources.

At the moment, nine collections from six different repositories are included in the portal. Among these are, for example, a large collection of texts from the *Bibliothek für Bildungsgeschichtliche Forschung Berlin* (BBF)⁷, over 50,000 pictures from school classes in Switzerland that are accessible in a database from the *State Archives of the canton of Zurich*⁸, historical textbooks and curricula from middle schools in the Italian-speaking part of Switzerland⁹, transcriptions from two large-scale historical school surveys from the end of the 18th century¹⁰ as well as

7 <https://scripta.bbf.dipf.de> (accessed 08.10.2021).

8 <https://archives-quickaccess.ch/search/stazh/klassenfotos> (accessed 08.10.2021).

9 <https://fondo-gianini.supsi.ch> (accessed 08.10.2021).

10 <https://stapferenquete.ch> and <https://archives-quickaccess.ch/search/stazh/suzh> (both accessed 08.10.2021).

data from the *Education by Numbers* project¹¹. Part of the re-implementation is the re-indexing of the existing collections and the addition of new collections, including children's drawings, periodicals and holdings from small archives and school museums. This heterogeneity in terms of the type and scope of the data is intentional, as the goal is to steadily expand the inventory and thus broaden the search for an increasing array of educational historical questions. Again, all of these sources will be full-text searchable or searchable for the metadata respectively. Also new is the approach of integrating the collections dynamically, that is, larger collections can be retrieved automatically via commonly used open access interfaces such as the Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH) and thus constantly kept up to date. For smaller collections, appropriate processes will be defined in cooperation with the collection providers.

Bildungsgeschichte Schweiz originates from the aforementioned project *Education by Numbers*. The main objective of this infrastructure project, which has been funded by the Swiss National Science Foundation (SNSF) since 2010, is to inventory historical statistics on education in Switzerland in the 19th and 20th centuries. How the collected data can be made accessible and attractive for reuse was an initial question that grew into the idea of *Bildungsgeschichte Schweiz*. A project-specific data browser served as the starting point. Due to the project's focus on building an infrastructure for future educational history research, the idea of adding more and other collections quickly became a focal point in the development of the new portal. Since November 2020, the platform has been collectively supported by an association whose membership is broadly based, including institutions and individuals active in historical educational research and teacher training as well as small, thematic archives and school museums.¹² The association plays an important role for the integration of other sources in the future. There is a common interest, especially among the aforementioned memory institutions in Switzerland, in making their holdings visible and thus more accessible. Many of the member institutions have relevant digital sources, whose integration we strive for. In many cases, the holdings become (full-text) searchable for the first time via the platform. The diverse needs of the association's members also enable a recurring discourse on the technical implementation. This goes far beyond Google & Co.

3 Reusability of data from historical research projects

The digitisation of research leads to more and more digital data collected and shared also in historical research projects. This requires not only the existence of specific infrastructures that allow a practical reuse of research data for the humanities, but also a specific handling of the data in the sense of research data management (Hügi

11 <https://www.bildungsgeschichte.uzh.ch> (accessed 08.10.2021).

12 <https://verein.bildungsgeschichte.ch> (accessed 08.10.2021).

& Schneider 2013; Müller 2019). It is likely that the Open Research Data (ORD) policies from research-funding institutions and initiatives such as GO FAIR¹³ will increase the volume of data publicly available in the future. These data may initially represent research results, however, they can also become the catalyst for further research (Bambey et al. 2012). It is quite easy today for researchers to upload data sets and additional documentation to repositories such as Zenodo or to an institution's repository in order to obtain a permanent identifier for their data that meets the requirements of academia and funding organisations.

Although there is a general consensus that publicly funded scientific knowledge should be shared with those who funded it, there are obstacles to the publication and sharing of research data that have personnel, organisational and technical-infrastructural reasons (see Kirschner 2019 for a recent debate on this topic in Switzerland). According to a recent study on ORD commissioned by the SNSF and swissuniversities, data sharing in the humanities and social sciences is not yet as common as it is in other disciplines (von der Heyde 2019). This finding is perhaps not surprising, given the open question of what should be considered research data worth preserving in historical research in the first place (Reh et al. 2020). According to von der Heyde, the Swiss research community is not so different from that of other countries in terms of data sharing and reuse. Whether the data is regarded as not relevant, whether there are intellectual property or confidentiality issues, whether there is not enough time until the end of a project or whether the data is planned to be published before sharing and thus kept "hidden" for own further research (von der Heyde 2019, 13–14, 37–40) – the reasons for not sharing data are manifold and often project-related. On the other hand, the number of places where data can be shared has increased in recent years. The study shows further that while both general and discipline-specific repositories are used to share data, data reuse tends to happen more via the latter (ibid., 18).

There are data being shared, nevertheless. The second goal of *Bildungsgeschichte Schweiz* is to make these data accessible for reuse. But what is to consider when integrating data from research projects into our search? First and foremost, research data are by definition embedded in specific logics of knowledge production, which determine what data are collected, how and for what purpose. What researchers consider the "data" for their research is driven by the research questions, the project goals and not least by the methodological framework of their work. Put differently, we could refer to the concept of "data ideologies", that is what researchers' "underlying assumptions about data are, what functions they do or not do serve and what consequences data might produce" (Poirier et al. 2020, 214f.). Some data sets are obviously more suitable for reuse than others in terms of their preparation and documentation, simply because information about how the data was collected, created or processed is often necessary to understand and use the data. We cannot but rely on a good docu-

13 <https://www.go-fair.org/fair-principles> (accessed 08.10.2021).

mentation of any data set provided. And, of course, it is reasonable to also integrate metadata and context data into the search (i. e., data papers and additional documentation). We can also ask what elements of any data set provided might be interesting for second users to work with and how these can be made accessible.

Berichtsjahr	Schuljahr	Lernende			Kommentar
		t	Fortbildungskld	LehrerInnense	
1871	1871/72	70		70	
1872	1872/73	k.A.		k.A.	
1873	1873/74	78		78	
1874	1874/75	k.A.		k.A.	
1875	1875/76	86		86	
1876	1876/77	k.A.		k.A.	
1877	1877/78	k.A.		101	k.A.
1878	1878/79	k.A.		104	k.A.
1879	1879/80	k.A.		k.A.	k.A.
1880	1880/81	k.A.	27	87	k.A.
1881	1881/82	k.A.	21	88	k.A.
1882	1882/83	65		58	7
1883	1883/84	106		103	3
1884	1884/85	100		96	4
1885	1885/86	k.A.		k.A.	k.A.
1886	1886/87	98		94	4
1887	1887/88	k.A.		k.A.	k.A.
1888	1888/89	k.A.		k.A.	k.A.
1889	1889/90	k.A.		k.A.	k.A.
1890	1890/91	k.A.		k.A.	k.A.
1891	1891/92	92		80	12
1892	1892/93	k.A.		k.A.	k.A.
1893	1893/94	k.A.		k.A.	k.A.
1894	1894/95	95		84	11
1895	1895/96	119	17	90	12
1896	1896/97	k.A.	k.A.	k.A.	k.A.
1897	1897/98	99	8	81	10
1898	1898/99	117	12	87	18
1899	1899/00	111	13	88	20
1900	1900/01	130	11	104	15
1901	1901/02	132	11	100	21

Fig. 3: Excerpt from a simple data table containing information on the pupils from a secondary school in the canton of Bern from the project “Education by Numbers” (Lehner-Loosli & Gebauer 2012).

Let’s take the *Education by Numbers* project as an example. From the start, this project has been about inventorying statistical long-term series for analysing the development of cantonal school structures and of vocational education and training in Switzerland in the 19th and 20th centuries. These data have been compiled in over 1300 tables to date, adding documents on the sources used as well as graphs and chronicles on the various school systems, all of which are stored in individual files (see excerpt of an individual data table in figure 3). The tables often contain additional source-critical information relating to the statistical categories, institutional change or even individual observations, all of which are not gathered separately as metadata or stored elsewhere. *Bildungsgeschichte Schweiz* allows an alternative and extended access to these data than it is currently possible via the project’s data browser with its simple metadata scheme in the back-end. The information recorded inside the different types of documents (i. e. spreadsheets, PDF files) can be accessed through full-text search. This provides a new approach for accessing the project data that goes beyond the ontological structure of the project.

If the reusable output of a project consists of a more complex database structure, then further questions need to be asked: What should be searchable in the first

place? And vice versa, what should be retrievable? For example, in a relational database, should it be primarily the relationships defined for research purposes that are made searchable, or do researchers rather tend to opt for the “raw” material of the database? A full-text search could reveal relationships that were not hard-coded in a database. On the contrary, a clustering of the search along predefined categories also has its benefits. The dilemma between the re-creation of the (closed) structure of a database or to open it to new connections is a well-known issue and not exclusive to historical research. Regardless of the type of implementation, it is the responsibility of the secondary data users to critically interpret the results of their search queries and to systematically evaluate the results given a specific query – as it is the case with using other digital research infrastructures.

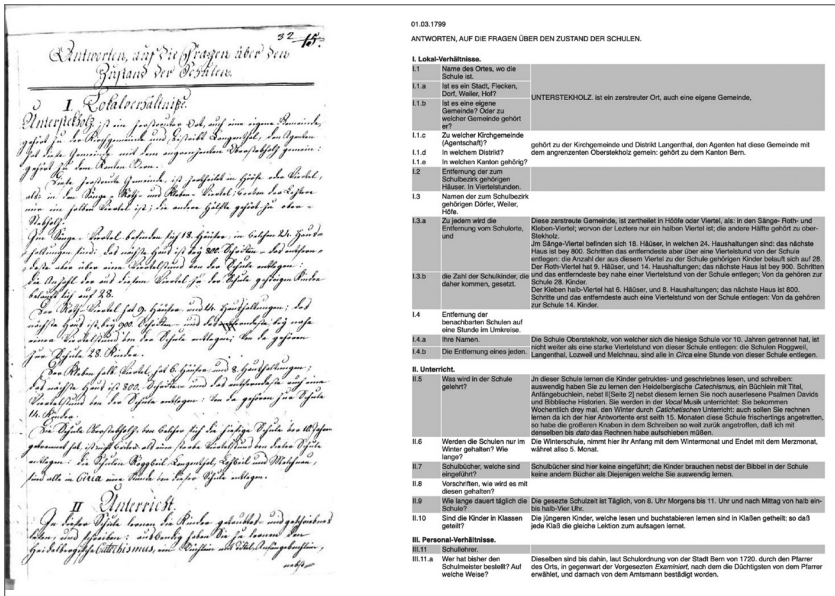


Fig. 4: Excerpt of a questionnaire transcript: answer from “Niedere Schule Untersteckholz”, 01.03.1799 (Schmidt et al. 2015).

Another research project, which has already been integrated into the search, is the so-called *Stapfer-Enquête* – a survey of all Swiss schools around 1800. In this case, we have decided to integrate only the questionnaire transcripts and to omit the links to geographical points on a map and other items that were collected during the research project (see transcript excerpt in figure 4). The raw material was made

full-text searchable, for which the project database was not designed for.¹⁴ Crucial for this decision was the consideration that the categories of the original data are linked to specific research questions (e. g., how today's school characteristics differ from those in 1799), which again were answered in the respective project context. Since data reuse usually seeks to answer other or further questions, we assumed that the raw material was more helpful for this purpose.

Knowing the context of the data is also important. If someone wants to learn about the inventory or is interested in the original database files, any search result contains a link to the respective repositories and the available documentation. This is also to give credit to the producers of the data. *Bildungsgeschichte Schweiz* wants to provide data producers with an attractive platform to make their data visible and searchable for the purpose of subsequent use by secondary users. Be it to derive new questions from existing data or to approach existing data with new questions.

4 Pro-amateur information space

With the spread of digitised sources and data in the public sphere, the history of education is suddenly within everyone's grasp and perhaps no longer just a domain of research. *Bildungsgeschichte Schweiz* contributes to this kind of "revolution" by making sources accessible to anyone who is interested. For the researchers, it opens the space for pursuing new questions and provides an opportunity to recontextualise their work in the light of the work of others. It is of particular interest to educational science that this tool can also be used in tertiary teacher training. Teachers themselves can use the resources for their teaching to help their students understand that education is and has always been a historical matter. With the association behind, the aim is to build a solid cross-project and cross-institutional infrastructure that works, is easy to use and is collectively supported by institutions as well as by individual users active in the field of educational history. In the meanwhile, the digital humanities do not stop to confront us with questions regarding how methods, technology, and institutions change the way historical research is conducted. We think this confrontation is a good thing. As a discipline, we have to find beneficial ways of dealing with technology and – if not embrace so at least – critically engage with the potentials that digitalisation brings to our field. Indeed, beyond the rhetoric of just "making everything accessible", some important questions related to historical research remain vital: Of course, researchers still have to formulate precise research questions. They must look critically at the sources and

14 In the same way, applying a full-text search possibility to raw data from other projects such as the subproject C of the Sinergia project "Lehrpläne in der deutschsprachigen Schweiz seit 1830 – Inhalte und Konstruktionsprinzipien schulischen Wissens im Wandel" would be interesting for the platform. For a project's description see <https://www.uzh.ch/blog/ife-hbs/forschungsprojekte/abgeschlossen/schulwissen> (accessed 8.10.2021).

data they find in a particular way. The contextualisation of these sources and data is equally important. *Bildungsgeschichte Schweiz* as a platform wants to use the advantages of digitisation without fundamentally changing the way how historians work. In other words, we want to help to prevent data graveyards, but not at the price of research that is only focused on using digital data for its own sake.

Search machines have contributed greatly to making spaces of the past accessible. Yet, they should not be mistaken as spaces of universal knowledge (Haber 2013). Rather, they represent a new form of textuality (Bilansky 2017) which can open new fields for inquiry. Put differently, the (combined) full-text search simply does not have an equivalent in the analogue information space (Haber 2011). What is required when using a particular infrastructure is a conceptual understanding of the differences between the search (i. e., finding texts), the search results (i. e., based on the indexed materials) and the techniques and methods to further proceed with the found sources or data. Coupled with the digitisation of historical resources and the prospective developments in open data, modern search technologies make *access* to information an easy piece today. The challenge remains to unfold and understand the order of knowledge and information behind: What is there and what has been left out. This is, of course, not possible without prior knowledge in the particular research field and without considering the material aspects of historic holdings. Thus, we move with the times, but at the pace that we determine by ourselves.

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