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[Home](#)[Articles](#)[Works](#)[E-Resources](#)[P-Resources](#)[Notices](#)

Online Teaching Applications - Norwegian Examples

Frode Ulvand History Department, University of
Bergen, Norway

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Table of Contents:

[.01. Introduction](#)

[.02. Experience](#)

[.03. The Norwegian School System](#) and Curriculum Guidelines

[.04. The Digital Archive](#)

[.05. K-12 Teaching Applications](#)

[.06. A Brief Presentation](#)

[.07. Reading Historical Manuscripts](#)

[.08. Conclusions](#)

[.09. Notes](#)

[.01. Introduction](#) ([Back to Table of Contents](#))

January of 1998, the Norwegian Historical Archives and the University of Bergen published *The Digital Archive* on the Internet. The new digital archive contains several million nominative records of searchable sources like censuses, parish records, military records, tax records etc. During the current year, the local State Archive in Bergen will make almost all their frequently requested

sources available on the Internet as digitized images, searchable on indexes as part of the archive.

The University of Bergen, especially the History Department, have some experience in Computer Assisted Learning (CAL) for several years now and wish to take this experience further. In order to take advantage of the new material available at The Digital Archive, the University of Bergen have started the Online Teaching Applications (OTA) Project for all teaching levels. We have hired two teachers with experience in teaching history as well as in developing web-applications to produce teaching packages for the non-university level. These packages will be ready for use by next term. For the university level, the project is about to finish an interactive tool for learning how to read historical manuscripts.

This paper will briefly present these teaching packages as well as discuss the expediency of using OTA on different teaching levels.

.02. Experience ([Back to Table of Contents](#))

The History Department's use of Information and Communication Technology (ICT) started with the undergraduates. First year students in history were offered to take special CAL-courses. The idea was to provide the students with equipment and software to facilitate and encourage the students to spend more time writing. Norwegian university students read too much and write too little; the project wanted to change their priorities from reading to writing. *Absalon*, a software for writing and structuring texts developed in the department, was used at the beginning; later, the Internet was utilised for publishing student's essays and as a forum for discussions between the students and the teachers. The impact of the CAL courses were good at first. As information technology lost it's status as a novelty, however, it has become more difficult to motivate students to do the extra work which participation on the CAL-courses necessitated. Over a year ago, we introduced an entirely new subject - *History and Computing* - a half year course built on the first year exam in history. In this course the students learned how to use computers as tools in historical research as well as in the dissemination of historical knowledge. The course emphasizes databases, in both theory and practice; exercises with database software use datamodelling and analysis. The students are given grades based on a history project submitted as a web publication. The course is offered as a distance course mainly for teachers as well as for local full time students, and some of the student's projects here have taken form as teaching packages. Finally, we have students using information technology at graduate level, both in research and dissemination, producing historical databases (mostly source-oriented) and teaching material. The department has also been involved in developing computer tools for analysing historical material, at first as programs and material for

personal computers, and more recently as web-applications.

As mentioned, we are now engaged in a project for Online Teaching Applications, mostly for the K12 level, but also for the university level. Why is the university involved in this project, especially in developing K12 material?

There are several reasons:

- The main reason is that we have experience and knowledge in doing this. I have sketched out what we have been doing on different levels at the university. As we teach students, we are also in an excellent position to recruit the people we think are suitable to produce teaching materials. First we educate them; then, we recruit those with the most promising potential.
- Another reason is to prepare pupils for study at the university level. The students do not always possess the skills we want them to have, and time and effort is being wasted teaching them skills that we would prefer them to have in advance. By participating in the development of K12 teaching material, we also have an influence in what skills are to be emphasised in pre-university training.
- Further, we are also eager to see the vast historical material we have generated made available on the Internet for utilization in teaching.
- Finally, but not least, there is money in producing such materials. The government in Norway, as well as elsewhere, is directing substantial resources into developing information technology; funds for using technology are obtainable.

.03. The Norwegian School System and Curriculum Guidelines ([Back to Table of Contents](#))

Norwegian schools require ten years of compulsory education and three years of secondary education (high school). As the society has changed, the contents and goals of teaching have changed, and new school reforms now require guidelines to provide a national standard in teaching. Two general goals articulated in the present general guideline are: increase co-operation between pupils through project-work (not just in one subject, but involving different subjects in the same project), and the implementation of information technology, preferably using extended teaching material during a project (other than the text-book).

In Norwegian primary schools, history is not a separate subject but included in a wider subject called "Community Knowledge". The pupils at the end of primary school are expected to be able to formulate historical questions, analyse and interpret different

sources, and produce explanations, both individually and in co-operation with others. Use of information technology is not required but encouraged.

In secondary schools, the aims are more concrete. The overall aim is to teach the student to master a scientific way of thinking through:

- a) knowing methods used for collecting, scrutinising and analysing historical material, and using these methods in own work. (More in detail, the requirements expect the pupils be able to formulate questions, perform causal connection analysis, critical interpretation of historical sources, and evaluating existing historical interpretations.)
- b) working individually and in co-operation with others.
- c) taking responsibility for their own learning.
- d) implementing information technology as a tool in history.

In short, instead of reproducing facts such as names, dates, events - the pupils are supposed to become researchers or historians. It is indeed a very ambitious curriculum not least because of a recurrent problem in schools: lack of time. Doing what the guidelines require is very time-consuming. In order to achieve it, two prerequisites are needed: the availability of historical material and the applications to utilise this material efficiently. This brings me back to the recently opened Digital Archive mentioned in the introductory paragraph.

.04 The Digital Archive^[1] ([Back to Table of Contents](#))

The archive was opened in January of 1998 and is a co-operation between the History Department in Bergen and the National Archives. There is the National Archive in Oslo and eight local State Archives, dispersed around the country. So far, the digital archive offers several million nominative records, including the complete 1801 census with almost one million records. Other census material as well as parish records, emigrations records, military records, tax records, etc., are also available. By the end of May 1998, the 1900 census for all of Norway (about 2.3 million records) will be made available; by the end of the millennium, a large proportion of the 1865 census which will be completed. In addition to electronic and searchable sources like this, the State Archive in Bergen have initiated a program to make all their materials available on the Internet. Both microfilmed as well as other primary sources will be digitised as images organised by extensive indexes. The aim is to make the whole archive online within a few years. Figure 1 presents the opening page of the archive. ([Figure 1](#))

Browse and search tool

The archive is aiming at different groups of users. The

The archive is aiming at different groups of users. The genealogists, at home and abroad, will no doubt be the most numerous and frequent users, especially of the nominative material. Professional historians and graduate students are also expected to utilise the material. Furthermore, this vast material will be a rich well for pupils and teachers to draw from. [\(Figure 2\)](#)

Making tables online

The digital archive provide two different tools. One allows browsing and/or searching in the material; for instance, find all blacksmiths, or emigrants from a certain town, etc., and display these records on the screen [\(Figure 2\)](#). The other tool makes frequency tables, both in absolute numbers and in percentage; these can be downloaded as dif-files (data interchange format), and can be imported into most worksheets for further processing by the pupils [Figure 3\)](#). Thus, both researchers and pupils can easily aggregate information and compare properties of different social groups, regions, sex, etc.

.05. K-12 Teaching Applications [\(Back to Table of Contents\)](#)

To summarise: we have the historical material available on the Internet, and the curriculum guidelines require the implementation of information technology in teaching. These are sufficiently good reasons to produce online teaching applications. Importantly, we believe online teaching applications improve teaching.

First of all, implementation of information technology (ICT) and the Internet especially, in a pedagogical useful way, is impossible without developing teaching applications. Using the Internet to randomly search for information might do more harm than good. The search engines available are "stupid" agents that do not consider the relevancy, quality of the material, or how apt it is for children to comprehend the contents. Almost everything on the Internet is made *by* and *for* an adult public. The material the pupils are exposed to is abundant, fragmented and complex. The Internet is frequently lacking in authorised information; there is a constant need for continuous evaluation of relevancy and quality. Is this not a good experience and an important part of the learning? Certainly, being critical and assessing the relevancy and quality of material trains the pupil to a more active learning and away from the passive consumption of facts. But, what is good for the "strong" student is frequently tough on the "weak" student. Pupils who read well and grasp the contents of information quickly will improve in an open Internet setting; the pupils with reading disabilities might fail. Using the Internet outside the context of teaching applications might possibly produce losers.

Teaching applications or teaching packages, we feel, are thus necessary both to limit the information exposed to the pupils and to guide the student through the material. This not only limits

information overload, but it also encourages an efficient use of time. The pupils still make the decisions, they still to a large extent ask the questions, and they still interpret the sources and produce the final result.

.06. A Brief Presentation ([Back to Table of Contents](#))

Currently, we have two applications in history under development. Since January, two teachers, who both graduated from the *History and Computing* course in December 1997, have been employed part-time in developing one application each. Both made a teaching application as their project for the course and have experience in producing such. One application deals with the emigration from Norway to the US from 1825 to 1925, where the main source is the emigrations records for the latter part of the period. The other one with social history in Norway in the early 19th century using the 1801 census. The difficulty level and questions and assignments are increased step by step. Thus, all the pupils will be engaged, both the "weaker" pupils and the "stronger." It is important that the stronger pupils have something to challenge them, otherwise work with the applications will be boring and lose purpose. The increasing levels of difficulties makes it possible to use the application on different levels, but the aim is secondary school.

Submitting a text

The idea behind the applications is to operate on different aggregate levels, to go from the very local to the regional to the national level. With material covering the whole country, this is possible. Working with local sources is motivating for the pupils, especially when their community can be compared to the region or the nation as a whole. The most inspiring method to use the application would be to co-operate with classes in other regions. Such co-operation or at least comparison, is also facilitated by the possibility of publishing class reports which the applications offer. Most secondary schools now have access to servers where they can publish their own web-pages, but the applications provide easy access to publishing on our server, too. By filling out a simple form using the web-interface, a class or different groups of a class, can either enter an address to their web-pages or submit the report itself ([Figure 4](#)).

The reports published can be commented by others on the web, paragraph by paragraph if desired, by entering commentaries into the report ([figure 5](#)), or by submitting a comment as a new text. In addition to submitting texts, the same tools can be used for having electronic seminars or discussions. Each question or new topic is submitted using the form shown in figure 4 and will be presented in a list as in [figure 6](#). This list shows the title of the question/topic, who submitted it, when and how many responses. By clicking on

the title, the question will be given in full text ([figure 7](#)). If anyone wishes to comment on it, the same form is filled out again, and the comment is added to the text in figure 5, the new comment separated with the original with a line and with name of submitter and date of submission.

Thus, quite a few of the aims in the guidelines are met: interpreting and analysing sources, evaluating historical interpretations (mostly other classes' reports more than authorised textbooks), implementing ICT, co-operation in and between classes and regions.

In all, this exercise provides three elements in the applications; 1) the historical material, 2) the teaching material and 3) the publishing and discussions of pupil's work. Hopefully, having these three components interconnected will provide a dynamic junction for teachers and pupils, a place to meet and discuss nationwide and to establish co-operation.

The K12 applications we are developing have a rather general purpose: the aim of training the pupils to adapt a scientific and critical way of thinking encourages skills useful in fields other than history, of course. The applications not only intend to give more knowledge about 19th century emigration history or social history, but the applications train skills in being scientific, skills the pupils will bring to other topics and subjects.

.07. Reading Historical Manuscripts ([Back to Table of Contents](#))

Parts of our use of information technology at the university level have the same general goals, but in the university we also focus on training the students in more specific skills. The application now in the process of completion is for interpreting the orthography in historical manuscripts. Manuscripts from before the 20th century are normally written in gothic handwriting which most people of today are unfamiliar with. The application contains 140-150 scanned images of manuscripts, spanning from 16th to 19th century covering different types of sources and styles. The images were scanned in high quality colours from the original at the archive in 300 dpi resolution; when displayed on the screen, the images are reduced to 75 dpi, except for the zoomed lines. This gives the users a feeling of actually reading the original, and not just a bad copy, which makes it more attractive and motivating to work with. The images have a standard width of 750 pixels, and are compressed in jpg-format at somewhere between 200-500 kilobytes. These are large images and disadvantageous for users sitting on a slow modem. We have put the priorities to quality over speed, however, because a sufficient quality is essential when the image has to be interpreted. Besides, waiting a little while for an image you will be studying for the next hour or so, is not as big a problem as if the image had only an illustrative purpose.

Reading Gothic handwriting

We are making this application for two different sets of users. One

We are making this application for two different sets of users. One is the general public interested mainly in genealogy who wish to do research in the different archives; the other, is the person using the material in the Digital Archive for instructional purposes. The State Archive of Bergen shares the costs of producing it. Their interest is to provide a tool for the public to utilise the Digital Archive, an aim the University shares. The University, however, has the additional interest in using the Digital Archive as a tool to teach our students, the second set of users. ([Figure 8](#))

Feedback on interpretations

Almost every term, there are a few graduate students who need to read historic manuscripts, and as most of them are unfamiliar with the gothic handwriting, they also need to learn to read it. Because there are few students who need this every term, it is expensive to set up a separate course for it, which really means that the students have to cope on their own or rely on guidance from their supervisor, or take on a private course which might be offered. ([Figure 9](#))

Getting hints

Historical manuscripts are well suited for online teaching applications. What the student needs is a wide range of manuscripts available, ones that cover different styles, one to practise on, and one that offer the opportunity to check their interpretation against an authoritative translation. There is really no need for a teacher to tell you that a letter is correct or wrong.

The user starts by choosing a manuscript, then the line in the manuscript they wish to transcribe. The application tells the user how many words there are, and how many letters in each word ([Figure 8](#)). The user then types the letters into a form on the screen, and clicks on a check-button when finished. The suggestion from the user is sent back to the server and is checked against the correct transcription, and the suggested line is sent back. Where letters are incorrectly interpreted, a hyperlinked star is displayed instead of the letter ([Figure 9](#)). By clicking on this hyperlink, the application give you an explanation on which letters are easily mixed up with the one typed, also giving visual examples of these letters ([Figure 10](#)).

Zooming lines

The user is not told the right answer, only given hints on how to reach the right answer. Thus, the user needs to work it out on his own, and that is a much better learning process than just being fed the right answers. Some letters might be hard to interpret, and the user might never be able to understand them. Therefore, there is a possibility to the have the correct line displayed, but only by the "no pain - no gain"-principle - the user must have been able to interpret at least 75 percent of the letters correctly.

There are other tools in the application: archaic dictionaries (since

quite a few of the words are no longer in use), a visual alphabetic list of the main styles of the letters, zooming the lines to transcribe ([Figure 11](#)), and links to images in the Digital Archive with similar styles of handwriting. These images are for practise, and do not have the features the images in the application have, such as checking or zooming.

Producing an application like this is no doubt an advantage to our department. The students are offered a course they otherwise would not be offered. Some of the teaching is delegated to a computer and thus relieve some of the supervisors for teaching. This is important to the teachers since recent increases in student numbers have not been followed up by increases in staff. By making an application available to anyone on the web, it is not only an offering to our students, but can be used by students at other universities dealing with the same problems as we are. This is clearly one of the major advantages with online teaching applications; we can share teaching resources across institutions and regions. No doubt, such sharing works better where the teaching university is public and free.

This application, unlike the two aimed for the K12 level, is first of all meant to replace the teacher. The K12 applications certainly involve the teachers, but it serve needs difficult for teachers to provide. There are of course objections to put forward against replacing the teacher with a computer. In this case the computer is not replacing anyone as there is no official course in reading manuscripts, at least not at our department. Besides, learning gothic handwriting is a question of repetitive practising, of having the opportunity to check interpretations and getting hints; it is not necessary to be told how to interpret by a teacher.

.08. Conclusions ([Back to Table of Contents](#))

So far, we have had little experience in online teaching applications in teaching. The applications presented in this article are not yet finished. The experience we *do* have, suggests that implementing information technology is motivating in itself. It is a new way of learning and catch the interest of the students from this angle. But, as information technology becomes more more common and part of the daily routines for the students, the "new wrapping" of the teaching is not enough to keep the students fascinated and concentrated. Because online teaching applications are still quite new, applications that fulfilled its purpose yesterday or even today, will not do so tomorrow because it might lose its status as a novelty. More and more emphasis has to be put on the contents of the applications to keep the students motivated and concentrated. Our applications, both at the K12 and university level, really originates from the Digital Archive. The K12 applications could not have been

made without it; the applications for reading manuscripts might not have been financed without it. **This proves how important it is to put effort into creating web-resources that teaching material can evolve around.** Also, the opportunity for classes to compare regions and co-operate across regions suggest that building Digital Archives with nationwide material is useful. Hopefully, a common resource might generate a dynamic environment for teaching as classes compare, evaluate, and discuss problems in history with other classes.

.09. Notes [\(Back to Table of Contents\)](#)

[1] Url: <http://www.hist.uib.no/arkivverket>

<mailto:frode.ulvund@hi.uib.no>

[Home](#)

[Articles](#)

[Works](#)

[E-
Resources](#)

[P-
Resources](#)

[Notices](#)

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