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E-learning - an approach to teaching art history in the Internet age

Abstract

In March 2000 the University of Bergen launched its first course taught entirely online via the Internet. "E-learning Art History", a full-credit two-year undergraduate level course, proved to be a hit among the pioneering participants - all students who started the program finished it successfully and on time. The article summarizes the educational goals guiding the development strategy of the course, the technical advances in computer software and databases determining its structure, and the state-of-the-art visual-imaging technology facilitating its sophisticated design.

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Today, it is perfectly feasible to move university courses from the confines of the lecture hall to the cyberspace classroom of the Internet. It remains to be seen, however, if this is a sound approach to teaching.
In 1996 the Institute of Art History at the University of Bergen, Norway, initiated a project to test this approach. After a four-year development period, Internet-based classes for an introductory course in art history started on 15 March 2000. Sixty students were enrolled in the distant "e-learning" course. All teaching was conducted via the Internet; only exams were arranged off line. The course had no videocassettes, no satellite lectures, no live Internet broadcasts and no on-campus seminars. After nearly two years of studying over the Internet, all of the original students were awarded degrees in December 2002.

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Since its debut, the course has gained such popularity that the Institute has now employed two full-time co-ordinators. In addition, the University has been forced to limit the number of enrolled students to ensure the original goals and standards are not compromised.
The positive response to the course was especially gratifying since the development of the content was a lengthy and challenging process both conceptually and technologically. My colleague at the Institute, Professor Gunnar Danbolt, and I worked together to develop the pedagogical foundation. I then converted this synopsis into a computer-based model - a hierarchical network of tree structures connected by hyperlinks. This model evolved into the structured hypermedia system now known as SOFU (Strukturert Opplegg for Undervising).

The quest

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A search for answers to two fundamental questions guided the development of the course:

- How do we generate enthusiasm for the subject matter?
- How can we ensure effective subject-related interaction with each student when they are isolated at their own computers? (Especially in Norway where a student may be isolated by mountains, fjords, weather or very long distances.)

In a traditional classroom the teacher and students can talk together, have eye contact, emphasize a point by gestures, and so forth. Outside the classroom students can meet on or off campus and discuss the subject among themselves. Since these modes of interaction are less available over the Internet, it was important to find pedagogically sound alternatives in order to maintain the interest and commitment of the students throughout the two-year duration of the course. Regardless of the subject or course design, this is a rather long time for a person to study independently.

From the earliest development discussions, four pedagogical "tools" were identified as essential in the quest to successfully address the two guiding questions above:

- a modular structure
- visually interesting presentations
- subject-specific approaches
- opportunities for direct, two-way communication of assignments, ideas, concerns, etc.

The structure

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In contrast to an on-campus course in art history where students at the University of Bergen earn 20 credits by studying full time for one year, the Internet-based course is divided into four modules of five credits each. The complete course takes two years, with a module-based exam at the end of each semester or module. In our program, the first module deals with paintings and sculptures from ancient Greece up to the Baroque period. The second module continues with paintings and sculpture from the Baroque period to the present. Module 3 is purely architectural, encompassing everything from Greek architecture to post-modern. Module 4 focuses exclusively on Norwegian contributions to these periods and forms of art.
We took great pains to develop an on-screen working/learning environment that

would make it easy for a student to maneuver, minimizing the number of buttons, navigational levels and clicks of the mouse. Graphical design was a high priority.

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It was also important to be efficient as well as economical in structuring the database of information and images. On one hand a wide range of examples was essential while, on the other, the selections needed to be multi-purpose. Presenting material on-line made it possible to use a variety of techniques to supplement lectures and artwork analysis, (painting and sculpture analysis) that would not otherwise be readily available. These ranged from virtual galleries (see examples for architecture and painting A + B), excursions (Rome, London, Paris), and construction sites (see examples 1 + 2) to image and terminology banks to analysis of microscopic details in digital images.

An on-line, course-specific "campus" (Faglig Forum) was established as a forum for two-way communication between the University and the students as well as among the students themselves.

The technology

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By the time the pedagogical priorities of the course were clearly defined, technological advances - especially in the fields of digital imaging and interactive media - had reached a level that enabled us to set quite ambitious content and presentation goals. Digital imaging technology makes it possible to examine details of a work of art by analyzing, visualizing and even manipulating the images. New digital image storage techniques enable immediate interaction and many levels of hyperlinks.
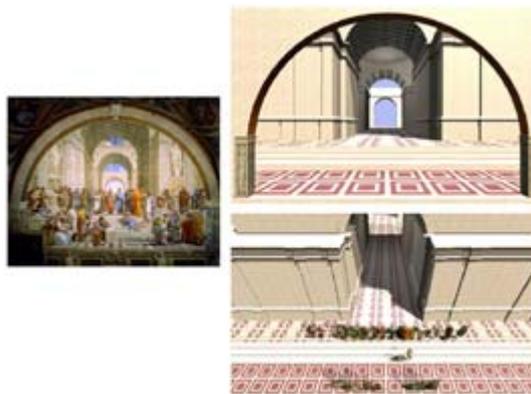
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These powerful capabilities were critical to the evolution - and ultimate success - of the distant learning, e-learning course we implemented. As shown in these

examples, a high-resolution digital camera such as the ProgRes 3012 enabled us to capture and visualize the most minute detail of pictures taken with this camera; better, in fact, than the human eye aided by magnifiers. For example, the engraved design of a Nøstetangen glass, dating from the 1700s, depicts a meal in the garden of the Hermitage Palace outside Copenhagen, Denmark. The intricacy and quality of the engraving would hardly be visible in a normal photograph or in a museum display case. Similarly, by zooming-in on-line, it is possible to distinguish individual threads in the design of a rosette on Norway's Queen Maud's dress.

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Interactive media such as the Internet, CD-ROMs, DVDs, etc. made it possible to link large amounts of course material, making it easier to search, retrieve, and cross reference volumes of information.
Combining digital imaging technology with the Internet enabled us to teach artwork analysis in a new and effective way. In his painting "Red Harmony", for instance, it can be argued that Matisse does not aim for depth and space but rather emphasizes two-dimensional surface characteristics by giving the tablecloth exactly the same design as the wallpaper. Common, relatively simple computer programs made it possible to manipulate the painting to illustrate, among other things, a line of analysis and debate for subject-specific issues.


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Although teaching students to interpret the visual expression of an artist is an important goal, it is a topic rarely taught in more traditional classroom settings (at least at the University of Bergen). The diverse resources available to the e-learning students made it possible to access vast stores of information or "knowledge databases" about an artist and/or work of art: the medium, the tools used, the way in

which these contributed to the artwork, details about motifs, techniques, choice of materials, and so forth. These resources made it possible to have the e-students examine the same artist or artwork in many different contexts and to search independently for other resources.

The design

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After identifying the pedagogical foundation of the distant learning course, we identified the topics to be included. This plan was then transformed into a pedagogical computer model, where each major topic is defined with related topics branching into a network of subtopics. Basically, the same branching approach used in any artwork analysis but, in this case, all subject-specific material was structured in a hierarchy. In presenting the major topic "paintings", for instance, the branching structure shows how an artistic device such as the choice of viewing angle, is first analyzed in terms of a horizontal axis, then a vertical axis and, finally, an axis of depth. The vertical axis, in turn, is identified as high, medium, or low. Hierarchies like this make it possible to present an overview of the different devices used in different mediums. In painting, for example, it becomes possible to identify the specific devices used by an artist in a single work. Organizing the material in this way, to increasingly finer levels of detail, was an intense, time-consuming task.
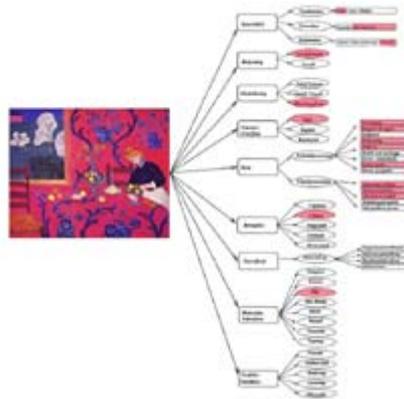
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When the design was complete we developed two computer programs - one for entering and organizing data, the other for presenting it. Talented students from the University's Department of Informatics, led by Stig Erik Sandø, handled the programming. A series of timely project-coincidences made it possible for the team to acquire state-of-the-art equipment (at least in 1998) in cooperation with Silicon Graphics, Norway. The team and the equipment were inaugurated by designing two electronic exhibitions for the Museum of Applied Arts (Kunstindustrimuseet) in Oslo. These exhibitions were landmarks in that they were "real" test cases for developing on-line content and presentations. They also provided firsthand evidence that the e-learning concept could be effectively implemented.

The beginning not the end

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The hypermedia system, SOFU, evolved step-by-step, in parallel with the development of the art history course. In essence, SOFU restructures subject-specific information in an SGML file and incorporates it into an ordinary, easily

accessible database. As it has evolved, SOFU has become a sophisticated, powerful tool, designed to meet the needs of several fields of study, not just art history. SOFU's development has kept pace with advances in technology and is now in its third generation. SOFU is not used for handling dynamic course data such as enrollment lists, bulletin boards, discussion forums or course administration. These and other teacher or student coordinated functions are handled by a browser.

After sitting for their first exam, an evaluation by the students of the e-learning course was positive beyond all expectations. Over 90% of the students submitted an evaluation and 58% of these rated the course as «excellent» while 42% rated it as "very good".