

Computer Planning Board  
Educational Subcommittee  
Implementation Plan

**Electronic Studio Plan**  
for  
**Humanities**

Spring, 1990

Plan for Educational Computing  
and  
Electronic Studio for Education in the Humanities

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1. Narrative Introduction

within the Humanities Division there is widespread recognition of the potential for enhancing the education process at Rice by the use of computer technology. Hence there is strong support for the electronic studio. The studio as envisioned will provide educational environments and tools that will be useful to both students and faculty working in the Humanities. Some of the tools will be intended to augment the abilities of the human mind by providing methods of manipulating information that are sensible to the person directing the tool, and to provide a flexible way of integrating the information they facilitate into a coherent, structured form. Another genre of tools is more active in that it will provide training exercises and simulations of real world simulated using the computer as a heuristic platform to support a mental model of a process or theory. While it is clear that no computer simulation can replace careful training of: students in the skills and concepts needed to interpret and comprehend the nature of the process being simulated, courseware tools can be thought of as an aid in posing and attacking a problem, providing guidance or feedback when necessary, and directing the student's progress when gaps in his or her understanding develop. The potential for the development of high quality courseware can be optimally realized only within an enriched environment like the electronic studio for education.

New tools or technologies do not necessarily find their best application immediately. Old ways are initially simply transposed to the new medium (Mac Luhan). Much of the courseware presently available for use in the Humanities is not of high quality, but the potential is clear. Many of the computing tools that are needed for supporting educational computing in the Humanities are, however, already available to universities that have the necessary hardware and networking facilities in the Humanities to make use of them. For example the X Windowing system developed at MIT and the Andrew system developed jointly by Carnegie Mellon University and IBM Corporation.

The X windowing system is well known at Rice, since it is already being used here. It facilitates a networking configuration that enables use of the environment by any type of machine. The X windowing system is freely available and is well suited for curriculum development.

Andrew is a product of the Information Technology Center (a cooperative venture between Carnegie Mellon and IBM). The system provides a wide range of utilities and tools to support

both scientific and human studies. It has three basic parts - ATK, AMS, and AFS, but the boundaries between the parts are not fixed or rigid. The Andrew Toolkit (ATK) is an object-oriented system for supporting the development of programs with flexible user interfaces. It not only supports simple graphic objects such as buttons and dials, but also supports the combined use of complex objects, such as multi-font text containing spreadsheets, drawings, equations, and even animations. The architecture of the ATK advances the state of the art of user interface toolkits with its innovative separation of composition and state, uniform data stream representation, arbitrary composition of objects, window system independence, and the ability to add new objects dynamically. The Andrew Message System (AMS) provides an easy to use multimedia mail and bulletin board system. It can be used to send and receive mail and bulletin board posts that contain embedded objects, such as spreadsheets or images. Through the use of distributed servers and multiple interfaces that use the same underlying delivery and storage system, the AMS can collect and deliver messages to high function workstations as well as to low function personal computer. AMS provides a variety of value added capabilities to electronic mail systems such as authentication, return receipts, automatic sorting of mail, vote collection and tabulation, enclosures, audit trails of related messages, and subscription management. The Andrew File System (AFS) is a distributed computing network developed to be the primary campus file system for Carnegie Mellon. The principal AFS installation at Carnegie Mellon supports more than 8,000 accounts and almost 1,000 workstations and personal computers. The system transparently support distributed, replicated data to enhance reliability and performance. AFS is evolving into a system capable of linking tens of thousands of computers connected by moderate bandwidth networks. The enhanced system permits independent and geographically distant organizations to share files while still permitting them to administer their data autonomously. The Andrew system thus provides programming tools to support development of new pedagogical applications that interface throughout the environment. This system also facilitates personal communications through its high speed electronic mail and document exchange capabilities. Publicly available discussion groups in the Humanities will also be possible using this system.

## 2. Specific Requirements.

(see Appendix)

### a. Computers and related hardware for public facilities.

The Humanities will require a computer lab in order to support student functions within the electronic studio. Hardware items needed for the workstations in the computer lab are included here. One possible scenario would be to create a new Humanities Lab by combining the current functions of the Language Lab with the functions required for the Humanities computer lab.

Because of the central importance of printed texts in the Humanities it will be essential to provide a high quality Kurzweil scanner for entering printed data into the system.

### b. Computers and related hardware for offices.

In our survey of the Humanities departments it became apparent that individual needs for personal computers in faculty offices were not covered completely in the research computing

survey. We have attempted here to include office hardware needs that would not be included under the estimates for research computing functions. We have included allowances for Appletalk and Ethernet configurations in each department in the estimates for office computers as a combined figure.

c. Computers and related hardware for other purposes.

In order to support the studio network in the Humanities we will need two Sun 4280s with 1.2 GB drives along with global Humanides access to the backbone network and local cabling to the workstations. One of the Suns will function as a file server for the entire Humanities network and should be reserved primarily for faculty and student use in the Humanities both for educational and research purposes. One of the Sun machines and two Mac IIs are required to support pedagogical and research needs in the Linguistics Computer Lab.

d. Software requirements.

The Humanities studio will require the X windowing software and the Andrew software. Both of these are available without charge. However it will be necessary for us to purchase X-server software for each PC using the system at a cost of \$200 to \$300 per copy, depending on price negotiarion. Additional software will be required for specific applications.

3. Connectivity.

An enhanced..networking: system is he single most essential requirement for any strategic implementation of the electronic studio. Students and faculty will be able to access the educational files through the X windowing system from any computer terminal, including a personal computer of any type. We envision a complete system of local cabling to the backbone via an Appletalk unit in each Humanities department for Macs and an Ethernet box in each department for IBMs and compatibles.

We recommend that the Sun 4280s be housed and maintained in the Mudd Building, and that one Sun be configured as a file server for the system and additionally as a driver for the high speed laser printers co be strategically placed at workstations to be located in the Humanities departments.

4. Support Functions within the Studio.

a. Faculty

Crucial for a significant tnpact of the electronic studio on the Humanities curriculum during the next five years will be a support staff specifically for the Humanities that will provide personnel with the expertise to manage the hardware, maintain the facilities, conduct research on available courseware and software, and above all consult with Humanities faculty on specific projects in their disciplines. The support function within the electronic studio will be much more important in the Humanities than perhaps in any other division, because of the lack of familiarity of many Humanities faculty members with computer technology beyond simple word processing. In our interviews with the Humanities chairs and the faculty it

became very clear that there is a great deal of both active and latent interest in the use of computers in the Humanities curriculum. Large numbers of faculty members have clearly expressible ideas that will be implementable in the electronic studio, but do not yet have the computer literacy to realize them. Faculty members will be encouraged to make full use of the support staff's expertise for orientation and training and to take advantage of the other support facilities to be put into place in the Humanities Division (see b. Students and below).

#### b. Students

Planning in the Humanities includes provision for a new course for training Humanities students in the use of computers in the curriculum and in their research. Additional ongoing support for student use of the electronic studio could be provided through the Humanities Lab.

It will be necessary to provide easy access to the network in the residential colleges for students who wish to purchase their own computers. This will not be a major item of expense, particularly if the use of twisted-pair Ethernet over telephone wires proves to be possible. Eventually the colleges could be encouraged to provide rooms with workstations for use by college members.

#### 5. Impact of Plan on the Humanities curriculum between now and 1994.

with the requisite hardware, software, and networking facilities in place in the Humanities, and with a strong support organization to encourage and facilitate implementation of ideas for innovation in the curriculum, the impact of the electronic studio in the Humanities will be substantial.

Specific applications in the Humanities curriculum will differ somewhat from discipline to discipline. The studio will provide software and courseware for curriculum innovation in language learning; in computational linguistics projects, including student training in artificial intelligence, machine translation, linguistic analysis, theory testing, and discourse analysis; in writing instruction in the English curriculum; in textual analysis and philological projects including concordance construction and use in the ancient and modern literatures, and in historical linguistics and religious studies; in student work on formatting and portfolio layouts and photographic reproduction techniques in photography; in statistical work and patterns analysis in education courses; in pedagogical presentations of many sorts; in word processing, including use of special fonts and characters in Chinese and Japanese language instruction, etc.

Many courses in the Humanities already make use of the sparse and scattered computer facilities that are available to Humanities faculty. The studio will make it universally possible for all Humanities faculty to incorporate significantly more data and reference material into the classroom environment. It will improve the ability to manipulate the data and thereby enhance the interpretive process. Because of its tremendous potential it will facilitate change in teaching methods as well as the content of our courses. Over time it will significantly alter both the quantity and the quality of the content in the Humanities offerings at Rice.

without the facilities of the electronic studio with its unifying concept, Rice University will continue to fall hopelessly behind other universities in curriculum development, even those of currently lower rank than Rice.

Notes:

Software: the \$25,000 figure for the first year air; based on an estimate rather than hard facts. The Andrew software license is estimated at 60 users times \$200 = \$12,000. We know that programs like the Oxford Concordance Program which will be needed for literary 'research and teaching cost \$400 per user. The \$10,000 yearly thereafter represent a cost for acquiring new software as well as upgrading and maintaining old one, and also for developing custom-made software for specific purposes, on campus or with the help of consultants. These funds should be put in a special account under the control of the Dean of Humanities and balanced forward from year to year to allow for greater flexibility in software acquisition and development.

Staff two full-time employees will be needed. One will be a specialist in computing for the Humanities who will organize the computer literacy courses for Humanities students and act as liaison between the Division of Humanities and Information Systems. An administrative assistant or a secretary will also be needed to assist the specialist. Fringe benefits have not been taken into account.

Students: Students will be needed as lab monitor in the electronic classroom where computer literacy courses will be taught. The figure of \$16,000 represents 40 hrs per week at up to \$8.00 per hour for fifty weeks. Some students will also function as tutors to faculties wanting to acquire computing skills in their own office.

Maintenance: the cost of maintenance is based on a figure of about 5% of the total initial cost of the hardware and increases by 10% each year. These funds, under the control of the Dean of Humanities, should also be balanced forward from year to year in order to maintain subject Jam funds to meet any emergencies.

Amortization: Every year, starting the first year, a sum representing 1/7 of the total initial costs should be put aside and balanced forward for replacement and upgrade of equipment within the five year plan. At the end of that period the balance of these funds will be applied toward replacement of obsolete equipment. It is expected that most of the equipment will last more than seven years given proper maintenance and upgrades.

Equipment requests: public, offices and others: the number and type of items

requested is based on requests from the departments interviewed. The basic idea is to put a computer on the desk of every faculty requesting one and one for every 10 graduate students in the department. Whenever the information was available, the figures were adjusted to avoid duplication of requests for computers for research purposes. It would be useful to compare the figures for educational and research purposes at some points

Space: It will be necessary to find about 2100 square feet of space for the electronic classroom (1500 sq ft), the optical scanner (300 sq ft) and the two Sun workstations (300 sq ft).

Initial costs:

|                   | Description                                     | Location            | cost    | Subtotal |
|-------------------|---|---------------------|---------|----------|
| Public facilities | Electronic classroom                            | TBA                 | 150,000 |          |
|                   | Optical scanner Kutzveil                        | TBA                 | 35,000  |          |
|                   | 2 oats video projectors<br>+loser video disk    | SH(T8A)<br>RHIO     | 31,200  | 216,200  |
| offices           | 58 Mac II's connected to Appletalk & 'backtone' | misc.<br>Offict3    | 290,000 |          |
|                   | 1 Mac laptop                                    | Health              | 3,000   |          |
|                   | 3 laser printers                                | misc.<br>Offics     | 6,000   | 299,000  |
| Other Areas       | 2 Sun Workstations                              | Mudd                | 60,000  |          |
|                   | 2 NeXT Workstations                             | Lang.Lab<br>Art     | 16,000  |          |
|                   | 7 Mac II3                                       | Liq.<br>Art, Health | 47,000  |          |
|                   | 5 PCf   | Lang.Lab<br>Health  | 17,500  |          |
|                   | 2 bser printers                                 | Ling.               | 4,000   | 144,500  |
|                   |   | Total Hardware      |         | 659,700  |



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# MEMORANDUM

## CLASSICS

TO: Albert van Helden

FROM: Harvey Yunis

SUBJECT: Computers in Classics and Ancient Mediterranean Studies

DATE: April 23, 1990

Thanks for your interest and help in setting up computer facilities for Classics and Ancient Mediterranean Studies.

There are two distinct uses which computers can have for us now, one basically for research purposes, one basically for undergraduate instruction. However, it is likely that students would at least occasionally use the research facility and professors would use the instruction facility.

### I Research facility

One can procure on compact disks virtually the entire corpora of ancient Greek and Latin literature. There is also now available a disk that supplies much of the extant papyrus fragments. I have enclosed with this memo some information about the Thesaurus Linguae Graecae, which is responsible for supplying the basic Greek compact disk. The TLG disk is the most expensive disk; it is leased with regular updates for an institutional site license for a fee of \$500 for five years. The library has already taken out a lease on the TLG disk, but it does not yet have either the equipment or a place for this disk to be properly used. There are readily available at nominal cost programs to manipulate the vast quantity of data that comprises the extant literary remains. The aim is to be able to search by computer for any word, series of words, set of words, etc. through selected authors or the entire corpus. To use these disks either of the following hardware configurations is preferable:

- 1) Mac SE/30 with 4 MB RAM, 40 MB hard disk, and compact disk ROM drive:  
approximate cost - \$4800.
- 2) Mac IICx with 4 MB RAM, monitor, 40 MB hard disk, and compact disk ROM drive:  
approximate cost - \$5800.

### II Undergraduate instruction

A team centered at Harvard University has for several years now been developing the Perseus project., a hypermedia database about Classical Greece. The aim of this project is to enable students to study Classical Greece through a set of interrelated layers of information. The elements that comprise this information are: major texts from the period

in English and Greek, historical, linguistic, literary, artistic commentaries on these texts, basic reference information, specialized studies, maps, figures, photographs, and video segments. The information is related throughout its parts by means of hypercard, enabling the student to follow pre-planned lessons, or to roam at will. With this memo I have included a brief description of Perseus. Perseus has been conceived and constructed so that it will grow indefinitely. This material is especially suitable for our growing Ancient Mediterranean Studies program, since it is designed for students who do not know Greek and who are encouraged to take an interdisciplinary approach. The Perseus project would be especially useful in the new core course in Ancient Med. that is being inaugurated this fall. To use the Perseus material a configuration such as that described in #2 above would be suitable, with the addition of a laser disk drive and a high quality monitor.

It would be ideal if we could set up these computer facilities somewhere in Fondren in an easily accessible room that was restricted to these uses. It would not be necessary to buy two configurations to accommodate the two types of uses described above. I have not included a printer in the above configurations; a Laserwriter IIsc would be suitable (about \$1750). Access to the facility could be controlled by a limited number of keys issued to appropriate faculty and by student monitors. Such a room could provide the central locus for a growing program in Classics and Ancient Mediterranean Studies.. The room could also be stocked with basic reference books for the field, and it could serve as a study room and seminar room for our students.

c.c.: Michael Maas, History; Don Morrison, Philosophy