

FACULTY COMPUTER LITERACY PROJECT

FINAL REPORT

by

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November 1984

CS84013-R

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The Faculty Computer Literacy Project* has been in operation for three quarters during the academic year 1983-84 and has been staffed by:

J. A. N. Lee, Professor of Computer Science
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During the fall quarter, time was spent in two major activities -- preparing a detailed outline for the first quarter of the Faculty course based on a proposed Student Literacy proposal, and becoming familiar with the IBM PC.

The Winter quarter (1984) saw the enrollment of 24 faculty in a course with supporting assistance from staff of the Learning Resources Center. Robert Steffan undertook to provide instruction on the uses of the IBM PC, while Dr. Roberts Braden and John Moore (IDD) supplied criticism and direction on the lectures and demonstrations. An IBM PC was provided to the project by IBM through the grant obtained by Dr. Chachra. Each lecture was video-taped by the staff of the Television Unit of the LRC and is available for review by both the individual lecturers and the course designers. Hopefully these will provide both a record of the work and a basis on which renewed presentations can be constructed.

While the quarter was a moderate success two major elements emerged:

- (1) A clear objective for the sessions was not established early in the quarter and thus presentations switched back and forth between outright presentations of the material which was proposed to be presented in the Student Literacy course and pedagogical discussions of how this material could and should be presented.
- (2) The preparation for laboratory periods was insufficient and it soon became clear that one cannot simply turn faculty (and much less anyone else) loose on the PCs and expect them to have a true learning experience. Once laboratory sessions were established with directions and tasks, such as might be used in a student environment, these sessions improved greatly. Individual counselling sessions organized by Ms. Miller were much more successful.

* The original proposal for this project is included in the Appendix.

The evaluations of the participants regarding this first quarter were mixed, though the major complaint was the lack of homework! If such a session were to be presented again, we would recommend that:

- (1) The objective of the lectures should be to present the very same material as the student's receive without recourse to pedagogical discussion. The second quarter would then contain this review of presentation methods and a critique of material.
- (2) The laboratory periods should be separated from the lecture sessions so as not to waste the overhead of moving between buildings. Preferably a small laboratory of (say) 3 PCs could be established for faculty usage with sufficient space for small groups (such as members of the same department or college), and that the teaching assistant could schedule "individual" periods for each group. The use of the library facilities met with some opposition from students who desired to use the equipment and their presence occasionally generated an environment in which it was difficult to concentrate and to do some real work. Moreover the restriction of 50 minutes, once a week, is not conducive to useful progress. Most faculty do not want to have to compete in an "open" laboratory with freshmen who already are more skilled than themselves. If feasible, we would suggest that such a laboratory should be established within the Learning Resources Center with manufacturers encouraged to contribute equipment and (almost MORE importantly) software.

The use of the Southern California Consortium (SCC) telecourse (The New Literacy) should be emphasized and faculty encouraged to watch this at the same time as the students who are enrolled in CS 2980. However, it might be much better to convince WBRA that they should show this material over their channel and thus allow faculty to watch it at home.

The second quarter of the FCLP was much less successful. The original plans were to present materials which would be taken from the upper division courses in CS so as to provide the faculty with a better understanding of the student computer literacy material and to suggest ways in which their own uses of the computer might be enhanced. Based on personal perceptions of the likelihood of the success of this approach gleaned from the first quarter, a slight modification of the plan was introduced. That was, to interweave such lectures with presentations on the applications of computers to fields other than CS. Starting the quarter with a group of 24, this dwindled to a core group of 12-15 by the end, with the best attended sessions being those on applications. The advertised session by Dr. Haralick on image processing (and the hope of talk of the work on the shroud of Turin) brought some people back only to be disappointed when Dr. Haralick was called out of town. It is our opinion that certain amount of "advanced" CS material is possible, provided that the participants can see the application of that material to their work. The second quarter should be redesigned to provide:

- (1) No more than 3 sessions on advanced CS -- comparative languages, computer architecture and operating systems,
- (2) Five presentations of the applications of computers on campus (hopefully with tours of facilities or hands-on exposure), perhaps including assistance from the Computing Center,
- (3) Open discussions and debates on the pedagogy of teaching "computing" (perhaps directed and led by the Learning Resources Center), and
- (4) Continued availability of the faculty laboratory with new problems and new systems with which to experiment.

A major factor in any further work on this project must be its adequate funding. While the funding for 1983-84 has been sufficient, it took away from teaching commitments in the Department of Computer Science thereby exacerbating an already critical situation, and used funds for materials which were not originally designated for such a use. Consideration should be given to soliciting funds for this Faculty Computer Literacy Project from outside sources in the form of "fellowships" for the participants so that they can obtain release from their other duties in order to become involved, for the support of the teaching staff both in Computer Science and the Learning Resources Center, for the provision of equipment and supplies, and for the development of materials that can be used University wide in similar courses for students.

The offering of another FCLP course should be coordinated with other offerings throughout the University. The Computing Center, the Learning Resources Center and the School of Education present courses (mini-courses) which have content which overlaps with that of the present FCLP course. The CEC offers courses which promise to give "Computer Literacy" when all that is really offered is simplistic programming (in BASIC!). While not to infringe on the mission of the Computer Science Department, it might be suggested that the Vice-President for Computing Resources be charged with such a coordination activity, or at the least providing a common motivation and objective which will bring these various activities into sharper focus and into a common understanding of meeting University needs.

No decision has been reached at this time regarding the continuation of this project in 1984-85, though it was originally anticipated that Computer Science would be involved directly for the first two years of operation. Once established it was expected that this program could be operated by the LRC. A decision to continue, together with a commitment of adequate support should be made as soon as possible.

Independent of this course, we learned many things about the administration of the "PC program" on campus. It is not clear who is in charge of this program and who has the responsibility for making decisions about this equipment after it has arrived on campus. Clearly the decision to acquire and recommend is Dr. Chachra's and the program within the College of Engineering has been ably led by Dr. Nunnally, but for the rest of the University there is no acknowledged leadership. In many ways the choice of actual hardware is irrelevant; the choice of software, on the

other hand is a supreme decision. Licenses which are obtained by the University will determine what software is available in libraries and which is affordable to students. One of the major expenses incurred in this project which was shared between the Department of Computer Science and the staff was the acquisition of software for review and evaluation. Desk copies of software are not generally available for faculty to test and review and thus the expense of such procedures must be borne by either the department or the faculty member. The negotiations for acquisition of such software is probably outside of the scope of individual faculty members and the signing of licensing agreements on behalf of the University is clearly not within the scope of an individual. However there is no-one on campus who is charged with such acquisitions nor coordinating the needs of the University. By happenstance, we have discovered many copies of items of software that have been purchased by individuals and departments which duplicate each other. We cannot expect that software will be chosen like textbooks -- at the last minute; University coordination is needed. As a partial answer to this problem we have agreed to work with IBM, Prentice-Hall and Chambers Associates in the development of the "IBM PC Apprentice" program which is intended to produce student oriented software and textbooks for the IBM PC at very low cost (about the price of a regular textbook) and with easy diskette reproduction rights. While this program may not directly support the Student Literacy Program since we would be looking more for a "sampler" of packages rather than sets of individual systems. It is quite possible (and worth the effort) that this program will produce software which is satisfactory for student usage at prices which will easily compete with University licenses without the potential for legal problems.

With the move of Bob Stavros from User Services in the Computing Center there is no-one who coordinates the PC activities there; a new full-time appointment should be made as soon as possible. In fact, the combined power of PCs should exceed that of the central computing facilities soon, although the majority of owners will be individuals not the University. As much support will be needed for this new population as was provided to the main-frame users previously -- and this cannot be provided by individual departments. The time has come for the University to rethink its support of computing facilities and to recognize this new population which it has generated. Once this decision has been made then the direction of a Faculty Computer Literacy Project can be determined.

APPENDIXVIRGINIA TECH
DEPARTMENT OF COMPUTER SCIENCE
FACULTY LITERACY PROJECTJ. A. N. Lee Mary G. Miller
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November 6, 1984

INTRODUCTION

The emergence of computing as one of the fundamental disciplines threatens to overwhelm our future leaders unless some actions are taken immediately to provide a measure of literacy in the field to the student population now in the Universities of the country. A number of barriers to this exist; (1) there does not exist an accepted curriculum for computer literacy and literacy is often confused with programming language knowledge, (2) the faculty and equipment resources cannot be provided through computer science departments without enormous infusions of money and time, and (3) there do not exist qualified faculty in the "Ph.D pipeline" to staff such a program even if salaries could be made competitive with industry.

STUDENT LITERACY

The Department of Computer Science has proposed that all students at Virginia Tech be exposed to a basic course in Computer Literacy as part of the Mathematics Core Curriculum which we expect to be approved within the next academic year. However, it was determined that the cost of such a program exceeded the available University budget by an order of magnitude. Taking a leaf from the current proposals to move the cost of computing from the University to the customers (the students) by requiring students to purchase their own PCs, similarly it is suggested that this cost can be moved from the Department of Computer Science to the departments and colleges in which the students reside.

Irrespective of the need for student literacy, faculty literacy must come first in the logical flow. Student literacy could be left to chance, but then we would be relying on computer courses in the high schools.

If Virginia Tech is willing to take the lead, student literacy can be eventually moved into the high school arena in a form which we would find acceptable. At the same time the existence of this program within the University will allow the College of Education to develop a satisfactory curriculum for high school teachers.

OBJECTIVES

The objective of this proposal is to establish a sequence of courses at Virginia Tech which would train faculty in departments other than Computer Science to advance their knowledge of the field. It is the intention that faculty be trained in computer related topics to the extent that they would be able to assist the Department of Computer Science in staffing a University-wide computer literacy course and thereafter to teach courses with such titles as "Applications of Computers to ..." within their own discipline. It is not the intention of this program to reach a knowledge level that would create new faculty for the Department of Computer Science.

OUTLINE

The program will take place in two stages:

- (1) two quarters in which the faculty would be able to be involved in one (intensive) course each quarter, meeting one afternoon each week, with projects and assignments which would cover the fundamental core of computer applications from basic literacy to a working knowledge of the mechanisms of software development, and
- (2) a workshop to present the pedagogical elements of teaching a computer literacy course and to assist in the development of curriculum and materials for a course in computer applications in their own discipline.

At the same time it is expected that the CS department will be designing the mechanics of the delivery of the student literacy program which is expected to be based on one of the commercial systems currently under development. One such program will be available on PBS in the early part of 1984, consisting of 26 half-hour shows under the general title of "The New Literacy". This program is based on a new text-book published by S.R.A. and is being supported by a consortium of institutions in the University of California system.

STATUS

Currently there are 26 faculty enrolled in the course with four staff members supporting their activities. These include faculty from every college on campus as well as two members of the administration. It is expected that almost half of these will be involved in future course offerings either in their own department or as part of the Computer Literact course for students which it is expected to start in the Fall of 1984. Support for the course has been provided by the Provost's office through a grant from the State Council for Higher Education in Virginia (SCHEV), McGraw-Hill Book Company and Science Research Associates.