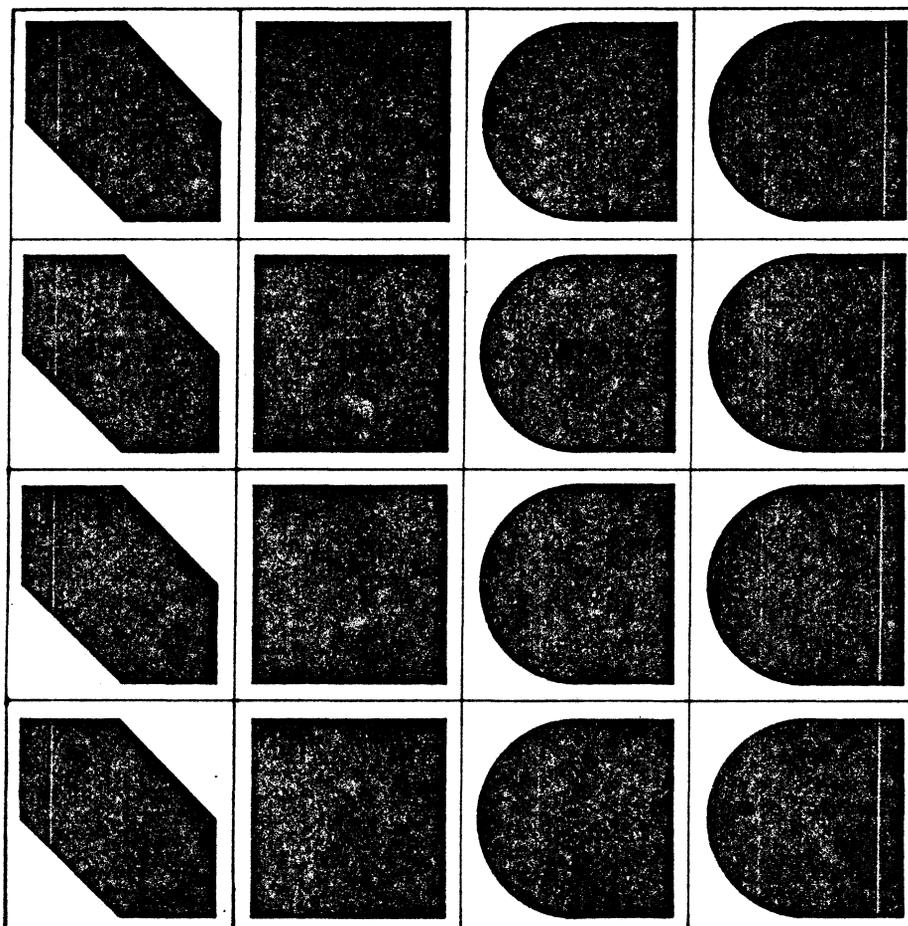


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- COMPUTER EDUCATION FOR ELEMENTARY SCHOOL TEACHERS PROJECT SESSION
- 183 Computer Literacy for Elementary and Middle School Teachers
Joyce Currie Little, Robert Wall
- 183 Microcomputer Simulation: An Aid in Training Elementary School Teachers
Harold Strang, Ann Loper
- 184 Toward Curriculum Development: A Case Study in Computer In-Service Training
Alice Ann Winner
- 184 Incorporating the Microcomputer into the Department of Mathematics Program for
Prospective Elementary School Teachers
Muriel Wright, Helen Coulson
- COMPUTERS IN EDUCATION PROJECT SESSION
- 186 Real-Time Microcomputer Programs for Teaching Statistics
C. Michael Levy
- 186 High School Science Microcomputer Project
John Pancella, John Entwistle, Carol Muscara
- 187 The Function Game: Using Microcomputers to Improve Grading Skills
Edward Zeidman
- 188 Computer Chronicon Project
Melvin Wolf
- INVITED SESSION INVITED SESSION
- 189 Where We Are Going in the Use of Computers in Public Education
Sylvia Charp
- SPECIAL SESSION SPECIAL SESSION
- 190 Computers in the Undergraduate Mathematics Curriculum
Sheldon P. Gordon, Chair
- 191 Simulation: A Teaching Strategy K-College
Beverly Hunter, Chair
- 192 Considering the Lack of Instructional Computing in Higher Education - Why?
Lincoln Fletcher, Chair
- TUTORIAL TUTORIAL
- 193 The Funding Game: Playing to Win
John T. Thompson
- COMMERCE PAPER SESSION
- 194 Designing a programming Course for MBA Students
David Cossey, David Possien
- 200 A Curriculum for a Master's Program in Computerized Materials Management
Daniel Shimsak, Dean Saluti
- 204 Information Literacy Course: A Recommended Approach
Eileen Trauth
- COMPUTER SCIENCE - TEACHING PROGRAMMING PAPER SESSION
- 208 A System for the Automatic Grading of Programming Style
Patricia Van Verth, Anthony Ralston
- 214 Teach Top-Down Programming While You Teach BASIC
Michael Streibel
- 220 Using Computer Simulated Models to Teach Programming Languages
Bogdan Czejdo
- COMPUTERS IN SCIENCE EDUCATION PROJECT SESSION
- 224 The Use of an Apple/Corvus Networking System in an Elementary Physics Course
Raymond Bigliani
- 224 Program Development by a Biology User's Group for Microcomputer-Assisted Instruction
L. Dove, S. Bryant, H. Edwards, K. Kendell, P. Nielsen, G. White
- 225 A Scientific Instrument Trainer
Robert Henkins
- 225 Concentrated Physics Concepts: A Comprehensive Package of Tutorial Problem Solving
David Alexander
- INVITED SESSION INVITED SESSION
- 226 Courseware Development from a Publisher's Perspective
M. D. Roblyer, Chair

Information Literacy Course: A Recommended Approach

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Abstract

Given the pervasiveness of computers in our society, much recent attention has been focused on the development of literacy courses to prepare students for this new era. The typical approach is a computer literacy course which introduces the students to some programming language. This paper presents an alternative course on information literacy. The goal of information literacy is to be able to respond to the demands of an information-intensive society.

Introduction

The arguments supporting the need for a literacy course in the computing area have been made and are widely accepted. What is not so widely accepted, however, is the form that such a course would take. The rationale for computer literacy stems primarily from the pervasiveness of information processing technology in our society. Most fields of study require interaction with the computer resource. Upon graduation, virtually all areas of employment will bring the graduate in contact with information processing technology.

The response to this need ranges from a service course in the computer science department to specialized courses within the various disciplines. Literacy in this regard is generally labeled "computer literacy" and aspires to make the students proficient in the manipulation of a computer via some high level language. The underlying assumption, it seems, is that learning how to successfully manipulate the technology is the best preparation for an information-intensive society. This paper suggests another approach, one based upon the goal of information literacy rather than computer literacy. According to this view, what should be the focus of attention is the information itself. The computer is viewed as a tool - albeit the major tool - used in the processing of information. Thus, it is studied - but from the viewpoint of its relationship to the information. Information literacy, then, is a broader concept than computer literacy. The goal is not competence in manipulating the computer, as the latter term implies. Rather, the goal is the capability of working with

information in whatever form it arrives and by whatever means it is processed - via computer, or otherwise.

Fundamental to this view is the notion that information is a phenomenon that has independent existence. Thus, one could study information in much the same way as one could study energy, or music, or basket weaving. The emphasis would be on the issues associated with the existence of the phenomenon. Some of these are technological, others are behavioral. Thus, the spectrum of possible study ranges from systems design and programming to human information processing to societal impacts of information. These areas of study are, however, shaped by an "Information perspective." This perspective means considering the phenomenon to be distinct from the media used for storage, processing or transmission. Since the focus is on the phenomenon and not the medium, a broader outlook is possible. Thus, the emphasis for problem solving would be on the satisfaction of the information need rather than on the manipulation of technology. As such, attention can be given to appropriate tools for information processing and transfer - whether it be print, electronic, video, etc. An additional aspect of this perspective is that it allows for the behavioral component. Since the various media involved with information are seen as being only the tools, the focal point can become the people - those affected by these tools.

Such an approach to literacy will enable the student, in this author's view, to cope with the issues surrounding an information-intensive society that go beyond manipulation of the tools. The student would develop a methodology for "learning to learn." Additionally, the student would develop an orientation toward information as an explicit and valuable organizational resource. Finally, assuming that most people will be users of information rather than developers of its systems and technology, they will be able to develop their ability to articulate their information needs and communicate them either to another person or to a machine.

Recommended Undergraduate Literacy Course

There are certain assumptions underlying the recommendations that will follow. First, it is assumed that this is a required course for all students in the academic unit - the department, school, or college. Second, for the majority of the students, this literacy course might be the only computer-related course that they will take. Third, it is assumed that one of the goals of such a course would be its integration into the subject matter of the major discipline. That is, this course would become an integral part of the student's educational experience. This reflects the attitude that the study of information should not be separated from the setting in which it is to be used. A final assumption is that the study of information is not synonymous with the study of the technology used to process it. The latter is an aspect of the former.

In keeping with the emphasis on information literacy this course should, among other things, familiarize the student with the information environment. That is, the student should become comfortable with the process of articulating the information requirements of a given situation. In addition, he/she should be able to identify and understand the role of information flows within the organization. For this reason the course should include discussion of notions associated with information as an independent entity. The origins of information should be examined relative to the situations in which the students would be working with information. The properties of this phenomenon should be examined as well. In order to do this, it is necessary to understand the distinction between data and information. While this may seem fairly obvious, there appears to be much confusion over the terms as evidenced in students' perceptions about the topic. A recent discussion in an introductory course yielded such responses as:

"Data is what you have when you use computers; information is what you have when people do the work."

or

"You take information and put it into the computer and do things like statistics on it and then you get data as the output."

The viewpoint held for this proposed course is that data should be understood to be the raw material out of which information is created. It is, therefore, information in potential. Data, when processed, does not necessarily result in information. It only does so when the recipient of the data is capable of

understanding it and is motivated to do so. Some of the distinctive properties of information that can then be noted are the following: Information has subjective existence, while data has objective existence. Information is not depleted with use. Information is intangible. The overall intent of the treatment of information as a distinct entity with distinct properties is to separate the information content from the media or technology by means of which it is conveyed or processed.

A second major topic that should be addressed is that of systems. Many people use the terminology of information systems without ever having stopped to think about the implications of the term. Recommendations regarding the treatment of the term "information" have just been presented. Recommendations about the term "system" follow.

Students should first be introduced to the notion of a system in general (and accordingly, systems thinking). They should then probe the interaction of systems and information. Part of doing so involves examination of systems used for the processing and communication of information. These include software packages, new telecommunications offerings and manual procedures. Another aspect of the study of systems involves the study of the organizational systems within which information flows. If an information system is to automate the flows of information within the organization, then it is incumbent upon those working with such systems to be able to understand the existing framework that holds the information.

An overriding orientation that should influence the preceding treatments is the particular disciplinary setting. It has already been argued that information only has real existence within a given context. For this reason it is crucial to the introductory understanding of information and its systems that different scenarios of information generation and processing be used. Business students will encounter a different type of information than that for library science students. Liberal Arts students interact with information in ways much different from those of science majors.

A third major topic should be the study of information processing. In an era when the limits of computer processing continue to be expanded, students who may never take another formal course in this area need to develop a view of the entire spectrum. This involves treatment of three major areas.

If it is accepted that information is a phenomenon whose existence depends upon the characteristics of the recipient then it is necessary for the students to have some understanding of human information processing.

This includes treatment of both the ways in which humans process information in general and the ways that the particular people involved in the student's discipline process and use information. A secondary benefit is that this understanding is helpful when learning about machine processing.

Since commercially available software packages are increasingly the norm, students should have exposure to the types that they would be likely to use. They will then not only have experience manipulating "real world" software, they will also have the opportunity in an introductory course, to examine examples of more sophisticated software than they are capable of writing themselves.

The final aspect of information processing is to experience developing programs themselves. This is often the easiest segment of such a course. The students usually feel that they are working with something concrete that has specific outcomes. Despite the fears that some might have upon entering, by the end of the course the majority of students are usually quite excited about working with computers and are pleased with the acquisition of a new and valued skill. The challenge when incorporating a programming segment into such a course, however, is to maintain the proper perspective. The goal of the programming segment is not one hundred percent proficiency in some high level language. Rather, it is to understand how to process data into information by means of a computer program. The emphasis is placed on learning the input-process-output sequence. The students learn how programs work in general through writing specific programs. The particular language used is treated as a vehicle for conveying such concepts. With thirty to forty percent of the coursework devoted to computer processing only a subset of the language can be taught. The students are told this. They are taught enough to be able to see the way in which computers process data. Suggested constructs would be: simple input and output, sequential file processing, calculations, transfer of control and looping. By writing programs in a given language the students should develop a generalized understanding of how computers and software function. If some attention has also been given to human information processing then the students are able to contrast their own mental operations with the operations of the computer. This understanding has proven to be valuable when students encounter difficulties with their programs. A typical example is the holistic or gestalt approach to problem solving taken by humans as opposed to the linear approach taken by the computer. Another is the contrast between the amount of ambiguity each can tolerate.

The final topic to be covered in such a course should bring together the previous three. Through problems and cases the students

should examine the ways in which information, systems, and organizations interact. Again, such a treatment should be geared to the disciplinary setting. In a business curriculum the students would consider the information problems of industry and the available ways of solving them. A literacy course for a liberal arts curriculum might emphasize societal impacts of new technology, coping with the "information explosion," etc. One way that such topics can be woven into the fabric of the course is to have each student give a five minute presentation at the beginning of class meetings. The students are told to report on a recent journal or newspaper article. They typically focus on leading-edge applications, societal issues, and the new types of technology that are emerging. These talks often lead to stimulating discussions. In addition, the students are made to feel that a portion of the course is governed by their particular interests.

The Goals of an Information Literacy Course

A very important outcome of such a literacy course is the demystification of the technology. Students with no particular interest in or inclination toward computers develop a sense of self confidence. Through successful experiences with machine processing they are reinforced that with some knowledge humans can be in control of the technology.

Closely related is the second intent, that the technology be placed in the proper perspective: secondary to an understanding of the need for and the uses of information. The course should convey a user-oriented perspective. Since the majority of the students will eventually be users, this outlook is appropriate. Because majors should develop a sensitivity to the people for whom they will be working, this perspective is fitting.

The third objective can be inferred from the comments just made. This course should include both majors and nonmajors. Both groups will benefit from exposure to the other. Having a range of capabilities and interests poses a challenge to the teacher. This author believes, however, that the benefits are worth the extra effort. This type of literacy course provides nonmajors with an exposure to the entire field. By having majors take such a course as their introduction to the field they receive an overview of the range of issues rather than in-depth exposure to a narrow area (which is usually the programming dimension).

"The final objective of such a course is to provide the students with some tools for coping with the information-intensive society in which they will be working and living. By learning about information and how it is processed they will develop skills in "learning to learn." With increasing obsolescence of knowledge, this is perhaps the best that can be hoped for from an education.

Conclusion

This type of literacy course has been taught in a variety of institutions to diverse types of students. Student reaction is consistently positive. In many ways this type of course is more difficult than one which treats a narrower cut of the subject area. The body of knowledge is large and is constantly growing. Most textbooks are not oriented to such a course. But given the pervasiveness of information technology and the need for all students to learn how to cope with it, such a literacy course appears to be a reasonable response.