Abstract

This paper describes two integrated parts of a media distribution system. The first is a method of producing non-print information in the form of videocassettes by health professionals and the second explains how those programs are indexed and retrieved using a computer program.

Introduction

Significant changes are taking place both in terms of our knowledge base and in the manner in which we acquire knowledge. Biomedical communication is an example of a contemporary information system resultant of two specialized professions. This hybrid technological profession has an identity of its own which is different from that of either parent profession. Electronic technology, that phenomenon uniquely associated with the Twentieth Century, has changed the epistemological basis of knowledge.

Most significant, however, is the change which is taking place in the way in which we learn. Technological innovation is setting the stage for a revolution in learning which may surpass the Nineteenth Century concept of public education. Technology and availability of hardware are changing public education into personal learning. Interactive TV, auto-tutorial media, and the personal computer are here to stay. As a matter of fact it was an educator, not an automobile manufacturer who said, "Nothing is more irresistible than an idea whose time has come." The idea for the Twentieth Century is personal education.

EDUCATIVE VIDEO

What is missing from this picture is the software for using the technology. You can program a million dollar computer to play tick-tack-toe; however, you can also use a family computer costing a few hundred dollars for multivariate analysis. But why aren't teachers using technology in the classroom? One answer may be found in an article titled, "Why the Best Teachers Don't Use Television." Teachers from three institutions of higher learning, who were also distinguished by their teaching excellence, were interviewed and gave only four reasons why they don't use TV: TV has limited application in the classroom (75 percent), TV is a threat to personal contact (62 percent), TV is time-consuming and inconvenient (50 percent); and finally, the medium does not help build basic skills (25 percent). All of this would be denied by any competent media specialist; however, the important fact is that good teachers believe it. If Aristotle, Socrates and Plato were teaching today, the chances are good that they wouldn't use TV in their classes and that's a shame.

Understanding the nature of television is the secret of its successful use by the health professional, and it is only through using television that we can come to an understanding of its nature. Educative video mandates our active participation in the medium through the combined use of reading, writing, speaking and performing skills. Additionally, the program content is individualized according to the personal needs of the writer. Obviously, this approach differs significantly from television as a mass medium.

Learning is made real and meaningful by the active participation of the student in the learning process. Educative video is a term used to describe what happens to a student when he or she becomes the producer rather than the consumer of educational materials. This requires that the equipment needed to produce video programs be available and easy to use by the health professional—a condition which has immense implications for the widespread use of video and computer technology in health generally.

A second distinguishing characteristic of educative video is that it has an audience of only one or at most, a small group of individuals. The dual purpose of educative video is to educate both the writer during the process of production and the viewer as well. All the steps up to and including videotaping are important steps in learning for the writer. After videotaping, the responsibility for learning shifts from the individual to the audience.
A final characteristic of educative video is that the content of the program can be quite specific rather than something written for general appeal.

I am not particularly interested in disorders of the gastrointestinal tract; however, I certainly hope my physician is very interested in the subject when he comes to him with a belly-ache. The point is, educative video addresses itself to the specific learning needs of individuals.

In summary, educative video in the use of television as a medium for self-instruction in which the content is dictated by individual needs. Active participation by the learner is a requirement.

The discussion now brings us to the first of the two topics introduced in this paper and an example of educative video which I have called the Videopaper2. The Videopaper is a combined print and non-print medium which requires active participation by the learner using reading, writing, speaking, and performance skills to achieve educational objectives. These objectives may include patient information, medical education or any health-related curricula. The essential elements of the Videopaper process are contained in the mnemonic word I D E A.

I: Stands for Introduction or statement of objectives. The presenter may choose to begin with a series of questions which will be answered during the presentation which is to follow. The concept being introduced is derived from the content of a course, training project, or problem specific task such as "Administering Anesthesia" or "Care of the Tracheostoma by a Post-Operative Laryngectomy." In order to properly identify a concept, the writer needs to locate a significant body of knowledge that constitutes the concept under examination. External sources of information include libraries, data banks, universities and knowledgeable individuals. Internal resources include our personal experience and accumulated knowledge. The writer then determines the reality of the concept by using both external and internal resources.

D: Is for Demonstration. This is a real or simulated example of the concept presented as a process. It is also the reason why we use television. This visual and auditory medium is an ideal vehicle for the demonstration of a process. The demonstration may take the form of a physical re-creation of a concept (as in the case of "How to Give a Back Rub"). Or it may be a step-by-step depiction of a process such as in physical therapy. The point of the demonstration is to show that you really know what you are talking about. In order to demonstrate competency, you must first understand the concept.

E: Represents Evaluation. This takes the form of an interactive assessment device, usually a ten-item, true-false quiz based on the significant content of the Videopaper. All Videopapers must be accompanied by a paper-pencil test. Two objectives are met by this requirement: (1) It serves as a competency check on the author since a good question, clearly asked, reflects a fundamental understanding of the content of the program, and (2) It requires active participation by the viewer in that they must pay attention so as to pass the quiz. Of course, the quiz can be developed into a very sophisticated instrument with multiple choices and even made part of an interactive television program.

V: Is for Analysis. This is the heart of the experience. It is meant to reflect comprehensive understanding of the concept. As a process, the analysis has a beginning, middle, and end. It includes the introduction of the concept, an expansion of the concept in terms of specific attributes which help to define the concept, a clarification of the concept by means of visual and auditory graphics and/or demonstrations and a summary experience designed to evaluate both the author's level of competency and the viewer's depth of understanding.

In summary, the format of the Videopaper is quite simple. The four critical elements are conveyed through the memory cue word IDEA and the formula V-IDEA.

Where: V = Videopaper
I = Introduction of the concept to be presented
D = Demonstration of the concept by actual performance or through use of graphic examples
E = Evaluation of the concept through an author-constructed quiz
A = Analysis of the concept which illustrates self-learning on the part of the author

VIDEOAPER EXAMPLE

The Videopaper script is meant to be read aloud by the author and it includes a minimum of technical notation. It was created for use by the health professional who wants to use the medium of closed-circuit television as a means of communication. The Videopaper method can be easily applied to education, training and rehabilitation programs in schools, nursing homes, hospitals, and with populations as varied as students, patients, and health professionals.

The following is an example of how the Videopaper technique can be used as a learning experience for students and as a method of instruction.

First, the role of the teacher is to facilitate learning by focusing on the concepts derived from a course of study. This may be accomplished through traditional methods of
lectures, group instruction or alternate modes of traditional instruction such as term papers. Any course in which concepts are presented is amenable to the Videopaper Method. The role of the student becomes that of author of the Videopaper. Then both the student and teacher meet to discuss the selected concept and outline the details and procedures necessary for publication of the Videopaper.

At this point the student is ready for independent study and research. This is the most time consuming and educationally worthwhile phase of the learning process. The student is prepared with the individualized topic and s/he is provided with guidelines for developing the topic. Any visual aids or practice demonstrations by the student are constructed or rehearsed. Finally, the construction of the quiz by the student based on the content of the program completes this phase.

The next step is actual publication or production of the videocassette. By using a structured method, time expenditure, technical complexity and financial aspects are held to a minimum. Historically, these major problems have prevented widespread utilization of electronic technology by the consumer, however, with the application of efficient production techniques and standardized formats for scriptwriting, these are no longer legitimate excuses for not involving students in television production. Concurrent with this step is a profound realization by the author that writing, reading, speaking and performing enhance the conditions for competency. Similarly, the awareness that the Videopaper may be seen by others than the instructor creates sufficient stress to insure peak performance.

The final step is evaluation by means of a quiz based on the Videopaper. Additionally, the teacher is free to pursue the Videopaper and evaluate it according to whatever criteria has been established.

In summary, the Videopaper attempts to individualize learning at a time when information is expanding in all areas. The content is characterized by concept-performance techniques and the production process is standardized to allow efficiency and reduce technical complexity. Fundamental to the use of the end product is viewer evaluation; however, the primary goal is the learning experienced during the production process. The Videopaper offers a modern alternative to traditional forms of learning experiences. It not only takes advantage of modern technology, but incorporates a broad range of basic skills such as reading, writing, and speaking. At the same time it is hoped that health professionals and media specialists will use some of these techniques in writing and producing video programs.

But what do you do with these programs? Information storage and retrieval are fundamental to keeping a program of video production and use going.

Up to this point, the discussion has focused on the production of print and non-print materials. These materials include:

* A single videopaper program occupying a certain space on a videocassette.
* A typed script.
* A paper-pencil quiz.

Physical storage space in the form of metal office files and library shelves will contain these materials. In order to facilitate use of information, it must be systematized, stored and made easily retrievable.

The following is a description of one example of how Videopapers are indexed, stored, and retrieved using a computer software program.

**VICTER (Video Index Computer Retrieval)**

VICTER is a software program written in PL/I and runs on a UNIVAC 1100/61 main frame computer. Its purpose is to catalogue and retrieve non-print information in the form of 3/4" VTR cassettes filed in a library.

The Indexer program was co-authored in 1980 with Barr E. Ticknor, a graduate student in microbiology at Cornell University. It produces indices of Videopaper holdings when provided with appropriately formatted input data from cards or disc file. Indices are produced with arrangement according to filecode, course, author and concept.

The following variables, when incorporated into a software design, will allow for retrieval of non-print information in an efficient and user-friendly manner:

**FILECODE:** This is an alpha-numeric code used to identify an actual videocassette on file in a library.

**AUTHOR:** The person who made the videopaper. The format is last name first, comma, space, followed by initials of first and middle name.

**REVCOUNT:** The approximate location of an author segment on the tape. This is the starting place of the segment desired when the cassette has been fast forwarded from 000. A dash (-) separates the second three spaces which indicate approximate end of program.

**CONCEPT:** This is the title of the videopaper. Each title is crossreferenced three ways according to the concept. (For example, Neurophysiology of Speech Sounds; Speech Sounds, Neurophysiology of Sounds, Neurophysiology of Speech).

There may be additional variables which can give further descriptive information (for example, length of program, date, color or black/white, etc.); however, when properly executed, the program will produce a separate printout for each Videopaper consisting of the Filecode, Author Course, and a three-way cross-referenced index of concepts.
Finally, a separate program was written which produced labels for each cassette and included Title, Authors, Filecodes, location on the cassette, and length of program.

SUMMARY

The preceding discussion covered important changes in both what we learn and how we learn as a consequence of technological innovation. A new direction in the use of closed-circuit television described as educative video was discussed and the specific example of a video-paper was explained. Non-print and print information storage, and retrieval through the use of the VICTER computer software program was presented.

In order to facilitate communication of information, both production and distribution of media must be considered as a system. The system must be simple; yet capable of expansion and it must be practical so as to encourage user participation.

Bibliography
