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Matching Media, Methods, and Objectives in Distance Education

Charlotte W. Farr and James M. Shaeffer

Because of the salient role of media in distance education, the emphasis of past research has often been on the selection and effectiveness of a specific media technology. This is no longer the trend. In the current literature, there is a call for refocusing attention to curricular issues in relation to distance learning. For example, Stubbs and Burnham (1991, p. 27) have suggested that "[media] affect the learning outcomes only as they affect methods and techniques" and Miller (1989) has advocated that curriculum issues are more important than the delivery technology.

It is impossible in distance education to have curriculum without technology to present or mediate the material to students. Therefore, it is critical to clearly recognize the capabilities of the technology to be used in light of curriculum goals. The purpose of this article is to integrate the theoretical foundations of distance education programs with the selection of appropriate media. To begin, it is necessary to present the principles of learning that take place in face-to-face instruction and then relate these to education at a distance (Garrison, 1989). To facilitate an understanding of how to apply this knowledge to distance education, we provide a chart devised to optimize matching media and curriculum, even for the novice (see Figure 1).

Matching Teaching Objectives with Instructional Methods

To begin the examination of matching objectives with methods, we need first to understand how the various aspects of the teaching process, which combined with the role of communication, provide the theoretical basis for media selection. Gage and Berliner (1988) identify five aspects of the teaching process: educational objectives,

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knowledge of student characteristics, knowledge of learning theory and motivation, methodology, and evaluation. Acknowledging that all of these factors are important in the teaching process, we suggest that objectives and methodology are most germane to the proper selection of media in distance education. Specifically, once an instructor has optimally matched methodology and objectives, media selection becomes a routine matter.

Instructional Objectives

Most often, we have found that faculty are interested in matching the following objectives with their instruction: transmitting information, teaching procedures, teaching concepts and/or principles, developing positive attitudes, and cultivating appropriate values. For clarification, each of these will be defined.

Information is defined as the knowledge base of or the body of facts inherent in a discipline. For example, many introductory courses are primarily interested in introducing students to the basic information within a field. This is often done in large lecture sections.

Procedures are processes performed in a discipline. In the field of nursing, for example, this could include administering an antibiotic injection. In mathematics, it could be teaching the procedures for calculating the circumference of a circle.

A concept is an agreed upon set of parameters for a thought or a notion. It provides people a basis for understanding. For example, when we speak of a "chair," a common set of ideas brings meaning to the word. So, too, it is for more abstract concepts such as "democracy" or "freedom."

A principle is the relationship between two or more concepts. Again, principles are best defined by example: "Intelligence is positively related to school achievement." Some concepts and principles apply to specific disciplines, some apply across disciplines.

An attitude is a feeling for or against something. In some disciplines, part of an instructor's task may be to develop appropriate attitudes. For instance, in nursing it is desirable for students to acquire an attitude valuing hygiene.

Values are assignments of worth. It is the objective of some disciplines that emerging students learn to value concepts common to those held by others engaged in the discipline. For example, lawyers should hold the Constitution in high esteem, and literature students should value creativity.

Instructional Methods

Having identified and defined the potential

Figure 1

Selecting Media and Methods in Distance Education

	Information	Procedures	Principles & Concepts	Attitudes & Values
Audio	-readings -audio/vidoe tape -lecture -student presentation -guest speaker	-demonstrations -lecture -readings	-class discussion -peer teaching -case studies -panel discussions -group projects	-reaction panel -debates -panel discussions -class discussions -case studies -role playing
Audio Graphic	-readings -audio/vidoe tape -lecture -student presentation -guest speaker	-demonstrations -lecture -readings	-class discussion -peer teaching -case studies -panel discussions -group projects	-reaction panel -debates -panel discussions -class discussions -case studies -role playing
2-way audio / 1-way video	-readings -audio/vidoe tape -lecture -student presentation -guest speaker	-demonstrations -lecture -readings	-class discussion -peer teaching -case studies -panel discussions -group projects	-reaction panel -debates -panel discussions -class discussions -case studies -role playing
2-way audio/ 2-way video	-readings -audio/vidoe tape -lecture -student presentation -guest speaker	-demonstrations -lecture -readings	-class discussion -peer teaching -case studies -panel discussions -group projects	-reaction panel -debates -panel discussions -class discussions -case studies -role playing
Computer Conference	-readings -guest contributors	-readings -tutorials	-class discussions -panel discussions -group projects	-reaction papers -class discussions -debates -role playing

objectives, it is important to determine what methodology is best employed to accomplish these objectives. Generally, information transmission can be accomplished by one-way communication. In other words, the material is simply "presented."

Procedures usually are demonstrated and then practiced. Demonstrations may be live, or they can be prerecorded on video. More complex procedures, such as thesis research, also may require reflection and dialogue, or intellectual conversation. Concepts, principles, attitudes, and values all require reflection and dialogue. Additionally, instilling attitudes and values entails an appeal to affect emotions.

In considering the match between objectives and methodologies, it is apparent that the type and amount of communication required are critical elements. Instruction must be varied in accordance

with these elements. Simple information transmission needs only one-way communication, whereas all other objectives can benefit from two-way communication. If the objective mandates dialogue or discussion, then two-way communication also is mandated.

Matching Methods and Media

An intermediary step between identifying and matching objectives, methods, and media is determining which methods can be accomplished using which media. Because of the significance of communication, one aspect of media which cannot be ignored is the type of communication inherent in the hardware. For example, broadcast TV only allows for one-way communication, while audio conferencing allows for two-way communication. Depending upon the type of communication

required, there is a congruence between different media and certain methods (Farr and Shaeffer, 1992).

Matching Objectives, Methods, and Media

Extending this concept of congruence to include the media most commonly used in distance education; the authors have generated the chart shown in Figure 1. This chart, when used in conjunction with knowledge about proper communication, produces a fairly reliable formula for successful teaching at a distance. As the chart indicates, almost any methodology can be accomplished at a distance as long as one plans ahead and augments some technologies with others.

To reiterate, the rationale supporting the use of the model is based on the assumption that education is a communicative process (Garrison, 1989) involving at different times one-way, two-way, and intrapersonal communication (Gage and Berliner, 1988). The preeminence of communication in the educational process greatly influences the selection of media in distance education. Thus, three types of communication in education are discussed below.

Types of Communication

One-Way Communication

One-way communication, typified by the lecture, is effective for transmitting information. While a lecture is usually delivered face-to-face, there are other means of "lecturing." Some examples are: oral reports; slide, movie, or video viewing; audiotapes; and records. Some of these methods necessitate using media, some can be adapted to media. Thus, videotapes, audio conferencing, movies, audio tapes, and records are all suitable one-way communication media.

Two-Way Communication

Two-way communication, typified by discussion or small-group tasks, is effective for enhancing thinking skills, promoting understanding of concepts and principles, increasing problem-solving skills, promoting positive attitudes, and developing values. Other two-way communication teaching methods include role-playing, cooperative learning, dramatization, debate, and panels. Two-way communication is facilitated by such technologies as audio teleconferencing, audiographics, asynchronous and synchronous computer conferencing, the mail, and two-way video conferencing.

Intrapersonal

A special case of communication is individualized, or independent, study. It is often used for

coping with individual differences in students and for promoting independent, self-directed learners. Typical of individualized/independent methods are individual projects, homework, research assignments, programmed instruction, and computer-assisted instruction. While the student is communicating in these instances, the interaction is often between the student and the content, or within the individual. Print, computers, and interactive video are ideally suited for independent study.

High-Consensus Versus Low-Consensus Subject Matter

To fully understand the importance of varying the instruction depending on the type of communication required, it is necessary to digress and distinguish between high-consensus and low-consensus subject matter. Decisions regarding the likelihood of consensus are paramount in determining the type of communication required and, thus, in matching objectives and methods (Shaeffer and Farr, 1991).

High-consensus areas are those where most experts would agree as to the solution to a problem, assuming they have adequate training or expertise in the area. Once the "correct" answer has been determined, teaching others the solution to a problem becomes a matter of transmission, or one-way communication. Where the correct answer can only be determined in retrospect, if it can be said to be determined at all, then teaching others to understand the situation becomes a matter of dialogue, or two-way communication.

Conclusion

Good distance education is good education. "[T]here are no unique principles inherent in distance education which are not also inherent in mainstream education" (Sewart, 1987). What this article does is make explicit the components of mainstream education and relates them in chart format to the media utilized in delivering education at a distance. □

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Technology News

States to Fund Multimedia Materials. A partnership of the California Department of Education, the Florida Department of Education and the Texas Education Agency has awarded a development grant to the Los Angeles County Office of Education and its development partners Davidson & Associates, Inc., and Addison-Wesley Publishing Company, Inc.

Participating states will each contribute \$400,000 toward the development of a state-of-the-art multimedia history/social science system. Entitled *Vital Links*, the product will be targeted to middle grades and up, with an emphasis on the needs of Limited-English-Proficient (LEP) students.

Charles Blaschke, president of Education Turnkey Systems, Inc., consulting and market research firm focused on the K-12 market, comments that this contract award is "one of the most significant educational technology development awards to date. It is the first time that the three major adoption states have joined together to develop a common curriculum. It is also the first time that companies with the technology, curriculum development experience and market presence of Davidson and Addison-Wesley have undertaken a multistate project of this type."

Scheduled for completion in 1995, *Vital Links* will be owned and marketed jointly by Davidson and Addison-Wesley. Davidson and Addison-Wesley will also provide funding and technology for *Vital Links'* development. Davidson will provide project management and multimedia technology for the development effort.

Addison-Wesley will provide expertise in the development of content and instructional materials, as well as experience with state adoption procedures.

Tom Gibbons, a history and social sciences consultant at the Los Angeles County Office of Education, will advise on content and have fiscal responsibility for the project.

Vital Links will include several components to bring American history and social science to life:

- CD-ROM computer software
This will include a multimedia studio with extensive databanks of historical photos, documents, diaries, video clips, music and songs from America's past.
- Videodiscs
These will offer still and live-action video segments illustrating historical events, showing news broadcasts and interviews, and presenting media timelines.
- Print materials
Photos, pictures, newspapers, letters, and other materials will be included for reference by teachers and duplication for student use. Student magazines with material designed for family involvement and literacy are planned.
- Teacher support materials
Detailed scripts, lesson plans, a software-based management system and scoring guidelines will help teachers maximize their use of *Vital Links*, and help them to evaluate their students.
- Ongoing support
Vital Links customers can use a toll-free 800 number for direct access to technical support specialists.
- Telecommunications for both teachers and students
The *Vital Links* development team will produce two, one-hour live broadcasts showing examples of teachers and students using the product in the classroom and in the home. A panel of educators will answer phone questions from the live broadcast audience.

Vital Links will be designed in modules covering four to eight weeks of instruction. Each module will focus on a major topic that cuts across eras in American history and incorporates themes vital to the study of social science. Components will be designed to serve all students, but the needs of a growing population of Limited-English-Proficient students will be a top priority in the pedagogical design.

Says Donovan Merck, Director, Educational Technology Office, California Department of Education, "This unique partnership of leading states will allow the development and implementation of high-quality, technology-based instructional materials for use nationwide."