

Media selection for education in the allied health sciences

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INTRODUCTION

Communicating information and ideas is an important function of personnel in the field of the allied health sciences. Communications take place between these personnel and their patients, their patients' family, and society at large. If they are the staff of educational or training institutions, they also have to communicate with their trainees, be they public health inspectors, nurses, medical students, or doctors engaged in postgraduate studies. Traditionally, the medium for communication has been the unassisted human voice: the doctor or nurse talks to the patient; the public health inspector discusses a problem with a group of villagers; the medical teacher lectures to his students.

With advancing technology, various supplementary or alternative media and media systems (Teoh, 1973) are now available. Most of these are particularly useful in institutions where education and training in the allied health sciences are carried out. However, with the availability of these media, the question of selection arises. How does one select the most effective media or combination of media for a particular learning or teaching situation?

Currently, 35 mm slides and 16 mm films are being used in medical and nursing education courses. Increasingly, the overhead projector is being used as a replacement for the chalkboard or as a means of projecting a hastily-prepared transparency containing a mass of data to be presented. Slides and films are

shown because they contain illustrations (usually obtained from text-books) which happen to emphasize certain ideas or concepts within the prescribed syllabus. There seems to be little active consideration as to whether these media systems are suitable or not for the particular learning situation.

As the trend moves towards the using of learning packages as a supplement to or a replacement for the traditional lecture or for revision by individual students, the proper selection of appropriate media systems for these purposes becomes more important in the attempt to create the most effective learning situation.

Several schemes for media selection have been proposed (Briggs, 1970; Goodman, 1971; Merrill and Goodman, 1972) which have been available to educationists for some time now. However, these schemes do not seem to have been disseminated to any great extent to teachers in the allied health sciences. Most of these schemes are fairly complicated and there is an apparent need to simplify and present them in a summarised form so that teachers in the allied health sciences (who are not primarily specialists in instructional media) may utilise them to enhance the effectiveness of their instruction.

The objective of this paper, then, is to consider the procedures involved in media selection and to present a simplified scheme for the selection of media

systems which can be easily used by teachers in the allied health science field.

PROCEDURAL CONSIDERATIONS IN MEDIA SELECTION

Except for the occasions when real or models of real objects or subjects are used with the

accompaniment of the live voice (as in a lecture), media systems usually require mechanical, electrical or electronic presentation devices which serve to amplify sound or make visible pictures. In order to allow a system to work, a program or software package must be available. Hence the components of a media system are the medium itself, the program and the presentation device.

PROCEDURAL MODEL OF MEDIA SELECTION

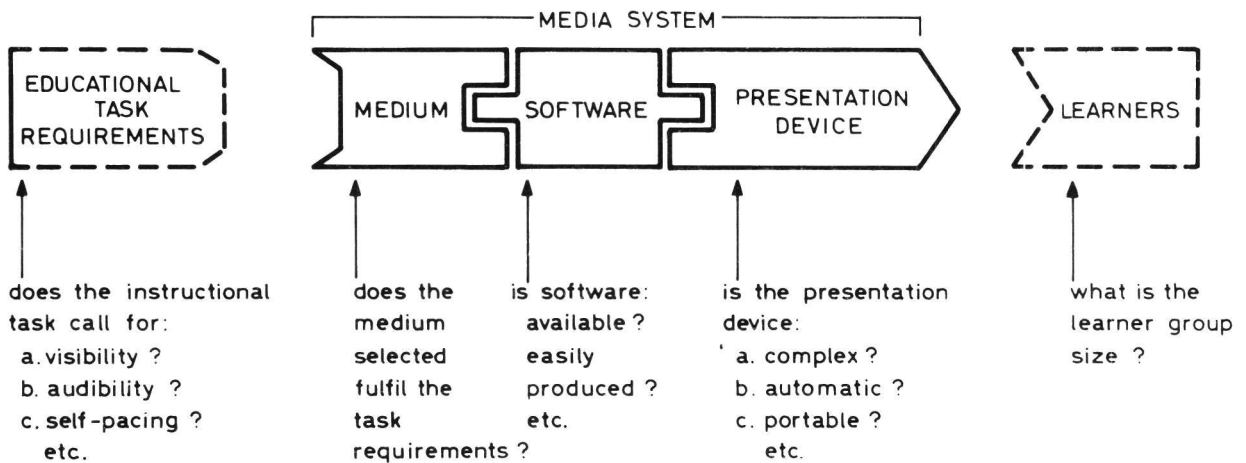


Fig. 1

In order to consider which media system would be appropriate for a particular teaching-learning session, the educational task or content requirements will have to be considered first. This step starts the procedural model of media selection (Fig. 1) in progress. For each component of the model, questions regarding facilitating and constraining factors or requirements are asked. These may be listed as follows:

1. Educational task: this component comprises the instructional requirements that are determined by the content material to be transmitted. These requirements will dictate the appropriateness of each media system considered. Some of the common instructional requirements may be listed as follows:
 - a. Visibility — whether the material to be presented requires that it be seen by the students.

- b. Audibility — whether the material is to be heard by the students.
- c. Self-pacing — can the medium selected permit the student to pace himself when progressing through the content material.
- d. Response — whether the medium selected can incorporate a demand for a response from the student.
- e. Motion — is motion required in the presentation of the content material?
- f. Time expansion and contraction — certain units of instruction may require a procedure to be shown in expended time i.e. in “slow motion” whilst others may require time contraction as in time-lapse photography where an event that takes a long time to occur can be speeded up in order to allow the students to see it in its entirety in a few seconds. Only certain media systems are capable of this procedure.

- g. Fixed presentation – whether the media systems allow the content material to be presented in stages that follow one after another.
 - h. Flexible presentation – denotes whether the teacher can rearrange the sequence of presentation at any time during the teaching session.
 - i. Sequential disclosure – at times it is necessary that the subject material be presented in sequential bits so that a principle or concept can be built up. All media systems should be capable of allowing this procedure.
 - j. Repeatability – it may be necessary to repeat the unit of instruction for multiple classes after varying periods of time. Can the medium selected for presentation allow this?
2. Learner group size: this is important as certain media are not suitable for large audiences unless they are coupled with other media systems. For example a demonstration in any anatomy dissection session cannot be seen by a hundred students in a class unless it is televised or filmed and then presented.
3. Software: this component carries the stage of media selection one stage further. After the consideration of educational task requirements and audience size, it is possible that a small number of alternative media systems are deemed suitable for a particular presentation. In order to present the subject material, software or programs must be available. Careful considerations concerning software includes:
- a. availability – whether prepared programs are available easily or can be adapted for use?
 - b. ease of local production – should prepared software be unavailable, can these be prepared locally?
 - c. reusability – once prepared, can these software be used over again?
4. Operational characteristics: these are important because presentation devices associated with the selected media system have to be operated. Certain constraining factors prevent the use of these presentation devices thus making the whole system inoperable. For example, if the darkening of the lecture hall is required and this is not possible, the system cannot be selected. The equipment may be complex in its operation and trained staff are not available; this prevents the use of the system. The unit of instruction may have to be presented away from the school or institution and the equipment is not portable and none exists locally. These operation characteristics are listed in Fig. 2.

SCHEME FOR MEDIA SELECTION

The proposed scheme for media selection is presented in the form of a table of criteria (Fig. 2).

The medium under consideration is presented on the left-hand marginal column of the table whilst the associated presentation device (s) is (are) listed on the right-hand marginal column. For each medium there may be more than one type of presentation device utilising a different format. The frame work (situational) and instructional factors are the column headings. These are grouped into four categories which in turn contain the various factors or requirements considered earlier. The body of the table describes the applicability or suitability of each medium (with the attendant presentation device) to these factors and requirements.

MEDIUM		FRAMEWORK AND INSTRUCTIONAL FACTORS												PRESENTATION DEVICE								
LEARNER GROUP	TASK / CONTENT REQUIREMENTS	SOFT-WARE			OPERATIONAL CHARACTERISTICS																	
		REPEATABLE	SEQUENTIAL DISCLOSURE	EASE OF LOCAL PRODN	REUSABILITY	DARKENING REQUIRED	SOUND FIDELITY	STEREO CAPABILITY	HEADPHONES	COLOUR CAPABILITY	SETUP COMPLEXITY					OPERATING COMPLEXITY	REMOTE CONTROL	AUTOMATIC CAPABILITY	PORTABILITY			
■	1 REAL OBJECT																					
■	2 MODEL OF REAL OBJ																					
	3 LIVE VOICE																					
	4 RECORDED VOICE																					
	5 PRINT																					
	6 PROG INSTRN.																					
	7 FLAT CHARTS/PIC																					
	8 OVERHEAD TRANSP																					
	9 FILM STRIP																					
	10 SLIDE																					
	11 MOTION PICTURE																					
	12 TELEVISION																					

■ = no or not applicable Y = yes F = fair E = excellent A = average
 ▲ = partly, □ = applicable P = poor G = good D = difficult S = simple

Fig. 2 Table of criteria for media system selection

To use the table, consider first the learner group size at which the unit of instruction is aimed. This may eliminate certain media as unsuitable. Then consider what the educational task requirements are. This would indicate which media systems are more suitable than others. From this shortened list of suitable media systems, consider the software factors for each. This procedure should eliminate some of the systems under consideration as software may not be available nor can they be produced. With the remaining suitable systems, then determine the operational characteristics of each. This last step should indicate what media system is most suitable and practical for the particular learning or teaching situation.

As an example, let it be assumed that a learning package is planned to allow medical students in the clinical years, either individually or in small groups to view the technique of performing a lumbar puncture and to listen to a commentary on the various steps at the same time. It is also assured that this package will be freely available to the students who can make use of it at their own time with suitable presentation devices located in a library. The steps taken in trying to select the appropriate media system for presenting this package may take the following course (utilising the table of criteria in Fig. 2). Initially, the learner group size and educational task requirements are considered. This may be represented in a tabular form thus:

Factor Considered	Requirement			Media System Applicable
	Yes	No	Preferable	
1. Small group or individual	+			all if combined
2. Visibility	+)	
3. Audibility	+)	
4. Self-pacing	+)	
5. Response		+		restricted to movie and TV with sound
6. Motion	+)	
7. Time expansion			+)	
8. Fixed presentation	+			
9. Flexible presentation		+		
10. Seq. Disclosure	+			
11. Repeatability	+			

After a consideration of the above factors, it is seen that the only media systems that are appropriate are sound motion pictures and television. Software factors for these two media systems are now considered. It is probable that already prepared programs are not locally available at this point in time. Thus it is possible that this program has to be prepared locally. The easiest production methods are those associated with the Super 8 mm film although other formats in the two appropriate media systems can also be utilised.

The Super 8 mm format can be wound into a film loop and stored in a cassette which can be

easily played back by the student repeatedly. The sound track for the commentary can also be easily striped on the film or film with an incorporated blank sound track can be used and the commentary added directly. From Fig. 2 it is seen that the Super 8 mm projector can be fitted with head-phones for individual use or connected to a speaker for small groups. It is fairly good in sound fidelity, simple to set up and to operate. It is also portable.

Therefore, the most suitable media system for the presentation of this particular learning package on the technique of the lumbar puncture in the Super 8 mm movie film is the film-loop cassette format.

REFERENCES

1. Briggs, L.J. (1970): *Handbook of procedures for the design of instruction*. American Institutes for Research, Pittsburgh. Chapter 6 pp 93 – 190.
2. Goodman, R.I. (1971): *Systematic selection*. Audiovisual Instruction. Dec. 1971 pp 37 – 38.
3. Merrill, M.D. and Goodman, R.I. (1972): *Selecting instructional strategies and media: a place to begin*. National Special Media Institutes, U.S. Office of Education. pp 109 – 128. (Instructional Development Institute Working Manual).
4. Teoh, S.T. (1973): Media Systems for education and training in the allied health sciences, *Med. J. Mal.*, 28: (2): 65 – 69.