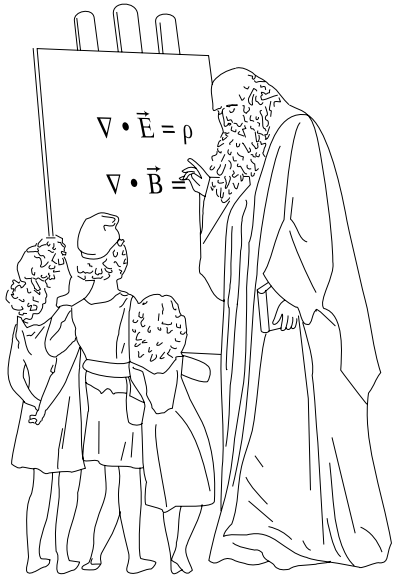
PHYSNET

MISN-0-83

BEST USES OF THE LECTURE



Project PHYSNET Physics Bldg. Michigan State University East Lansing, MI

BEST USES OF THE LECTURE

by

Lois Bauer

1. Introduction
a. Definition of the Lecture 1
b. Features of the Lecture 1

2. Identifying the Instructional Goal 1

3. When?
a. Only Information Acquisition is Needed 2
b. The Information is Needed in a Special Form 2
c. Immediate Learner Interest is Needed 2
d. The Presentation Takes Fifteen Minutes or Less 3

4. Critical Considerations
a. 'Authority-Dependence' Learning 3
b. Limiting Cognitive Development 3

Acknowledgments 4

A. References 4

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Author: Lois Bauer, (address unknown)

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1. Vocabulary: long-term memory, delayed recall, long-term retention, immediate recall, delayed retention (MISN-0-86).

Output Skills (Knowledge):

K1. Vocabulary: authority dependence, lecture, assimilation of information, accomodation of information.

K2. State four situations in which a lecture can be effective.

K3. State why the use of a lecture apparently does not enhance the retention of information.

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OF PROJECT PHYSNET

The goal of our project is to assist a network of educators and scientists in transferring physics from one person to another. We support manuscript processing and distribution, along with communication and information systems. We also work with employers to identify basic scientific skills as well as physics topics that are needed in science and technology. A number of our publications are aimed at assisting users in acquiring such skills.

Our publications are designed: (i) to be updated quickly in response to field tests and new scientific developments; (ii) to be used in both classroom and professional settings; (iii) to show the prerequisite dependencies existing among the various chunks of physics knowledge and skill, as a guide both to mental organization and to use of the materials; and (iv) to be adapted quickly to specific user needs ranging from single-skill instruction to complete custom textbooks.

New authors, reviewers and field testers are welcome.

PROJECT STAFF

Andrew Schnepp	Webmaster
Eugene Kales	Graphics
Peter Signell	Project Director

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D. Alan Bromley	Yale University
E. Leonard Jossem	The Ohio State University
A. A. Strassenburg	S. U. N. Y., Stony Brook

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1. Introduction

1a. Definition of the Lecture. The lecture is an instructional technology through which an agent of an educational enterprise, usually a teacher, uses a period of time to verbally present information and ideas (which may be a 'body of knowledge') about a specific topic to a specific audience of learners. This condition establishes a learning situation in which, to receive the information, the primary task of each learner is to listen.[1]

1b. Features of the Lecture. The lecture offers several features not readily available with other technologies. These features are the following:

1. It provides the opportunity for a group of learners to receive the same information, at the same time, from the same source;
2. It provides the opportunity for the teacher to control the amount of information received by learners;
3. It provides the opportunity for the teacher to control the pace at which information is disseminated to learners;
4. It provides the opportunity for the teacher to organize a body of knowledge for learners and present it to them with precision, lucidity, eloquence, and charm.

2. Identifying the Instructional Goal

In designing a learning situation, a principle factor influencing a teacher in the selection of an instructional technology should be the instructional objective and the particular tasks that must be accomplished by the learner to attain the objective.[2] Therefore, after analyzing the evidence reported in the articles reviewed,[3] the lecture appears to be the most appropriate technology to use in the following circumstances.

[1] Verner and Dickinson (1967) suggest that several other labels are applied to instructional technologies that establish the same learning relationship between the teacher and the learner. In this class they place the talk, speech, sermon, oration, and address. Studies which used these labels rather than the term 'lecture', are also included in the reviews of research on the lecture.

3. When?

3a. Only Information Acquisition is Needed. Researchers indicate the utility of the lecture when the instructional objective requires that learners make immediate use of the information received. There is no clear evidence to support the use of the lecture when the instructional objective requires that learners employ delayed recall or long term retention. Therefore, when attaining the instructional objective requires that learners engage in any activity other than immediate recall, such as, for example, the application of information, or analysis, synthesis, or integration of information, the lecture does not appear to be the most appropriate technology to use.[4]

3b. The Information is Needed in a Special Form. Learners' understanding of subject matter is very important in assisting them to attain the learning objective. When other available information is too complex, too detailed, or too abstract, a verbal presentation of this information that coincides with the experience of the learner will facilitate his or her learning.[5]

3c. Immediate Learner Interest is Needed. Learners' interest in a topic affects their receptivity to information about the topic. A teacher, through a lecture, can influence learners' attitudes that are required for only a short time. Experimenters have reported that subjects' attitudes changed through a lecture tend to regress toward their original position and may not persist beyond two weeks.[6] The interest aroused in learners

[2] See Glaser "Review of Educational Research, 46," and Mosston "Teaching: From Command to Discovery."

[3] The evidence of effectiveness of the lecture, relative to other technologies, was determined by observed differences in learning achieved by the subjects in the experiments as measured by tests of immediate recall and delayed retention. In most studies the subjects were students enrolled in high school, college, or professional programs.

[4] See Buxton "College Teaching: A psychologists's view," Hill "A comparative study of lecture and discussion methods" and Verner and Dickinson "Adult Education."

[5] See Larsen and Feder "Journal of Educational Psychology," Silvey "Public Opinion Quarterly," and Vernon "Occupational Psychology."

[6] See Levine and Butler "Journal of Applied Psychology," Lewin "Group Decision and Change," and Verner and Dickinson "Adult Education."

through a lecture, however, can be so significant that it may inhibit recall of information received.[7]

3d. The Presentation Takes Fifteen Minutes or Less. Learning from a lecture appears to diminish after fifteen minutes of listening, and after forty-five minutes of listening the learner is in danger of losing much of the information acquired earlier.[8]

Table 1. Learner attentiveness during a lecture presented by a brilliant scholar with an outstanding topic to a highly competent audience (adapted from Verner and Dickinson, 1967).

Elapsed time after start of lecture	Audience	Behavior
15 min.	10%	inattentive
18 min.	33%	inattentive
35 min.	100%	inattentive
45 min.	20%	transitive
47 min.	18%	asleep

24 hrs. later : 50% could recall only insignificant details about the lecture and these were generally incorrect.

4. Critical Considerations

4a. 'Authority-Dependence' Learning. Teaching through the lecture may result in the development of an authority-dependency relationship between the teacher, as the authority of information, and the learner who may become dependent upon this authority for information. Because learners receive information from an 'expert' through the lecture, and because the expert has logically organized the information for them, learners may be less likely to question the information received.[9] Morever, a pattern of using information organized by authority figures may make it difficult for some learners to learn in the absence of external structure.[10]

4b. Limiting Cognitive Development . It is widely known that different instructional technologies evoke in learners different cognitive activities which they use in their learning. For example, experimenters have reported that guided (organized) information evokes different cognitive activities that does unorganized information.[11] Consider then the cognitive activities probably evoked by the lecture. If indeed learners only 'acquire' information when learning through the lecture, and do not also retain it, the lecture evokes only the cognitive activities that enhance "assimilation of information."[12] It does not evoke activities that promote 'accomodation' of information. Without accomodation learners do not activate a mechanism with which to store information in long term memory. Egan and Greeno[13] in fact, suggest that externally organized information results in addition to cognitive structure and not integration of it.

Thus, perhaps the explanation for the criticism of the lecture often expressed by students[14] is less because of their displeasure with such factors as anomalies in the presentation, or learning in isolation, than because of the fact that they are denied the opportunity to integrate and retain the information that is presented to them.

[7]See Verner and Dickinson "Adult Education."
[8]See Harrell, Brown and Schramm "Journal of Applied Psychology," Trenamen "The Length of a Talk," and Verner and Dickinson "Adult Education."
[9]See Abercrombie "Aims and Techniques of Group Teaching."
[10]See Thomas "Review of Educational Research."

Acknowledgments

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[11]See Mosston "Teaching: From Command to Discovery."
[12]See Piaget "The Psychology of Intelligence."
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