

Preliminary data on student reaction to the use of time lapse movies in crop science teaching indicate that students agreed that such movies (1) satisfied course objectives, (2) should be used in the course, (3) led to better understanding of the course, (4) have a definite place in the classroom, (5) improved the course, (6) should be used during course lectures, (7) show crop growth more efficiently than other media, (8) should be used more, (9) enhance learning, (10) should be increased in number, and (11) should be used in other courses; while they disagreed that time lapse movies are (1) useless, (2) less effective than slides or blackboard drawings, (3) too impersonal, (4) inferior to videotapes as a teaching medium, and (5) conducive to sleeping in the classroom or laboratory.

Students tend to increase their conviction that time lapse movies have a definite role and place in crop science teaching as more films are used.

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INVITATIONAL PAPER

The Lecture Method

Thomas M. Sutherland

Introduction

I consider it a great honor to be invited to present this paper, which I had in fact prepared originally for presentation to our own faculty at C.S.U. in one session of our continuing series called "Let's Talk Teaching." Our President Bill Thomas was at that session and suggested we might well present it to N.A.C.T.A. in view of our vital interest in teaching and the use we all still make of the lecture.

An old adage says that good teaching involves telling your audience what you are going to say, saying it, and then telling them what you said; I would like to bow to this saying today and start by giving you an idea of what you are about to hear. First it seems to me impossible to discuss intelligently the lecture method as a means of teaching without grappling somewhat with such questions as "What is education?", "When is a man

educated?", "What is so-called 'good' teaching?", and "How do we evaluate teaching?". So I will throw out to you some ideas on this subject after which I will get to the heart of today's topic of the lecture method with a definition, some history, a discussion of the pros and cons and an analysis of the lecture method as it is used today. Finally I will try to set up a model of the "good lecture" and suggest some recommendations on how it can be put into effect!

Ideals of Education and Good Teaching

First then in a look at education in general, we can say and I hope agree that the fundamental aim of education is not just the training of a skilled technician or a competent professional—broadly stated, it is rather the furthering of good citizenship. Dewey says, "The aim of education is to further discipline, natural development, culture and social efficiency, which are the marks of a worthy member of society." Whitehead puts it even more loftily when he says, "The aim of education is understanding, . . . in the sense that to understand all is to forgive all." The basic purpose of a university then is to prepare the nation's youth for a life in which they can contribute not only to the maintenance but also to the furthering of society. The university, through the education provided, should help students to discover and develop their capacities for self-realization; it does so by providing opportunities for contact between the minds of students and professors and in so doing presumably exposes them to the very loftiest ideals of our culture.

This invitational paper was presented by Dr. Thomas M. Sutherland, Professor of Animal Sciences, Colorado State University, during the 1976 NACTA Conference held at Texas Tech University, Lubbock, June 16-18.

The very word, "education," comes from the Latin words *educere*, which mean to draw out. We are told that this is indeed what Socrates did, with his students around him — they talked while he interrogated and guided their discussion in the proper channels. The student then is the **center** of the educational process — the teacher takes the student as he finds him and helps him reach the highest levels of achievement of which he is capable.

The ideal of the university which is here presented as the means by which this education is accomplished is not simply as a **teaching institution**; it is rather a **center of learning**, a community of scholars constantly experiencing themselves the excitement of learning. It is from such a community of scholars that the student discovers and learns that essential ingredient of true education — the inquiring mind carrying on independent study. That cantankerous Irishman, George Bernard Shaw, once said, "If you teach a man anything, he will never learn."

The picture of the ideal scholar-teacher which emerges then, is of a man (or woman) of intellectual and moral stature with a positive view of life; he believes and conveys to his students the belief that it is possible for a man to acquire a sense of achievement plus a high degree of fulfillment of his potentialities. He is not only a scholar but is capable of becoming enthusiastic about his subject and can reveal that enthusiasm and inspire his students. He is one who cares genuinely whether or not students learn by showing his concern for their progress. He does not assume that **telling** is teaching but realizes that the student learns as much from contact with the teacher himself as from what he says. In this regard Emerson has said, "The man may teach by doing and not otherwise. If he can communicate himself, he can teach, but not by words. He teaches who gives, and he learns who receives. There is no teaching until the pupil is brought into the same state or principle in which you are; a transfusion takes place; he is you and you are he; then is a teaching and by no unfriendly chance or bad company can he ever quite lose the benefit."

Now it is in translating these foregoing rather lofty ideals to the practical and real terms of the university today that conflict and problems emerge. The growth of our tremendous industrial and specialized economy and society has put demands on the universities for quantities of "trained" graduates, and education is in a constant state of flux. An ever-increasing quantity of knowledge must be dispensed, and an ever-increasing percentage of high school graduates is entering the institutions of higher learning with the result that the **average** ability of the university student must be decreasing. In light of this last fact the professor may no longer be able to present himself as "exhibit A" in favor of education and to teach by example, exhortation, and inspiration, whereupon the students rush eagerly to the library to try to emulate such a paragon of virtue and scholarship! Much more spoon feeding may become necessary, and indeed may already have arrived! Einstein said, "It is nothing short of a mir-

acle that modern methods of instruction have not yet entirely strangled the holy curiosity of inquiry!" If this is so, we might well ask what is so far wrong with our modern methods, and how good teaching can be done today.

The Lecture Method

Teaching in the modern university is heavily oriented toward the lecture; in fact we can say it is without doubt the most important formal teaching method used. This is the reason then for asking today, "How good is the lecture as a vehicle for achieving our aims of education?" How does it compare, for example, with the discussion method, the independent study method, or the project method of instruction, all of great interest to contemporary thinkers in education?

A. Definition

The lecture is defined loosely as a continuing oral presentation of information and ideas by the professor; it is presumably a synthesis of his own reading, research, and experiences, interpreted in light of his own insights.

Theoretically, in the true lecture, little or no active student participation is involved. In practice of course we have much variation in how closely this format is adhered to. There is a varying degree of use of the blackboard, slide projector, assignments to be done outside of class and question and answer sessions; but all of these variants involve the lecturer as the primary agent in the instruction. The lecture is thus distinct from the other major recognized methods of instruction such as the discussion, Socratic dialogue, project method, and the laboratory.

B. Historical Aspects

The lecture has its roots deep in history. It is reasonable to suppose that as soon as man developed language he began to pass on his knowledge to the young by telling; this devolved into preaching and became tied to the priestly role in early societies. In the classic societies the lecture became formalized as the art of rhetoric and of oratory under such greats as Aristotle and Cicero who gave us the idea that the perfect orator is the perfect man. From that time on lecturing became an integral part of the scholastic process. With the growth of universities from the thirteenth and fourteenth centuries the **formal** lecture came into its own, and we can picture the professor of that time behind his elevated lectern reading from his own writings or speaking loftily on the writings of the ancients. Needless to say this form of teaching with all its inherent shortcomings has endured to the present day! If history can be said to teach us anything I think it must be that the formal "lecture" has by its nature a propensity for corruption; it is and has been too easily turned from a means of conveying, interpreting, and inspiring with the thinking, teachings, writings, and character of great minds into a sterile exposition, an end in itself.

C. Weaknesses of the Lecture

This is the lecture at its worst and it consists, according to an old adage, of transferring the notes of the teacher to the notebooks of the students without passing through the minds of either. And all too often the notes

of the teacher are taken from texts to which the students have ready access, and which they can read in 20 minutes instead of hearing for 50. The assumption is that the task of the teacher is to **tell** the students. We must admit that many students prefer it this way — the passive listening role saves them from assuming too much responsibility for their own education; indeed they frequently urge even greater use of this kind of lecture since the instructor can capsulize all the relevant information and save them the bother of a trip to the library! This represents, as we shall see, the grossest misuse of the lecture method, and the instructor who prides himself on the volume of notebook which his students have filled during his lectures is ignoring completely the evidence showing that learning has to be an active process involving considerable interaction between teacher and student.

In addition, this passive role, in which any activity of the student is precluded and in which no provision is made for individual reaction by him, can be insufferably dull for both the class and the instructor; if, however, the lecturer is **lively** with an engaging personality and a witty style, the experience can be relatively painless for the student! However, in more cases than not the worst sin of the lecturer is committed — he **bore**s his students! The boring lecturer is in many ways as much a menace to society as the incompetent physician. The latter leaves unsound bodies, but the former leaves stunted intellects. All too frequently the lecture method encourages the retention of facts as an end in itself, especially when "objective testing" is employed; whereas it is the ideas and principles understood and integrated which are likely to remain with the student, not facts memorized in rote fashion. And too often the lecturer doesn't know how much of the material is getting through to students.

Thus with the lecturer capsulizing the information for his students and giving them exams based on the lecture material, the student is compelled to accept as gospel all the prejudices, unwarranted assumptions, and mistakes of his lecturer if he values a grade at all! The students submit to authority instead of pursuing truth, evidence, and logic. The teacher is the final authority, and the exploratory aspects of learning are effectively thwarted.

The printing press and the duplicating machine long ago rendered obsolete this kind of lecture and lecturer. Especially is this confirmed by recent studies showing that learning by reading is superior to learning from listening to a lecture! Nevertheless, we must admit that a high percentage of present day courses hold the students responsible **only** for the material presented in lecture — few among us I suspect are entirely innocent — and the student becomes a sponge, soaking up the gems of wisdom dropped by the lecturer, and when squeezed in the examination, oozes the appropriate check marks from his brain and onto the I.B.M. sheet. Sometimes I think natural selection must be favoring now student brains with six compartments in each of which is contained an

instruction to check the appropriate box — kind of a 6-cylinder model brain if you will.

The lecture, then, often rambling and spontaneously produced without due regard to logical organization, clear exposition, and the psychological conditions necessary for effective delivery, and assuming that all students are equally prepared or interested to hear the same thing, is simply not adequate for teaching certain types of concepts. Attitudes, skills, and feeling are seldom learned through pure telling techniques.

D. Strengths of the Lecture

On this other side of the coin, it can be said that there is never a really good excuse for a bad lecture; and in this age of books, there is very little excuse for a lecture that merely imparts factual information. But a lecture may arouse, stimulate, give perspective on a subject, prepare the way for discussion, exhibit a mode of thought, present dramatically a movement of ideas in a way no other method can do. It can cause fertile and active mental reactions of a highly individualized nature in the mind of each attentive listener.

Some of the specific advantages of the lecture method are presented by Vavoulis (1964):

It vitalizes ideas which too often appear cold and impersonal on the printed page.

It serves to channel the thinking of all students in a given direction, and at the same time allows for clarification of and increased emphasis upon important points.

It is readily adaptable to the needs, interests, and background knowledge of each particular group of students.

It can serve as a model of good English expression.

It is excellent for introducing a new topic, for giving perspective to the class, and for summarizing what should have been learned.

It is economical of time and materials.

And finally, the obvious but often omitted, it does give the professor an opportunity to profess!

At its very best then, the lecture is a real display of learning. When delivered by a master, it is an experience never to be forgotten. Listen to the words of students of some of the greatest teachers we have known:

Carl Becker describing **Frederick Jackson Turner**, historian (1861-1932).

"I was daily enjoying the inestimable privilege of watching an original and penetrating intelligence at work playing freely with facts and ideas, handling with discrimination the problems of history."

Irwin Edman describing **John Dewey**, philosopher (1859-1952).

"I had been listening not to the semi-theatrical repetition of a discourse many times made — a fairly accurate description of many academic lectures—I had been listening to a man actually thinking the presence of a class."

James Russell Lowell of **Ralph Waldo Emerson**, essayist and lecturer (1803-1882).

"We do not go to hear that Emerson says so much as to hear Emerson."

E. Analysis and Research

In the light of all these pros and cons, then, if we attempt to discuss and analyze objectively the value of the

lecture method, we find that unfortunately there is a scarcity of **good** research into the effectiveness of college teaching. Little knowledge is available concerning which instructional practices promote, for example, critical thinking, and which promote or develop democratic attitudes. Researchers in education measure such things as immediate or short-term recall of facts presented in lecture, long-term recall of facts, changes in motivation or attitude, and morale of the students; but it is not clear to any of us exactly what is the role of anyone of these in the entire process of education.

Some studies show that **small groups** taught by **discussion** tend to grasp facts and to become more highly motivated than **large groups** taught by straight lecturing. Closed circuit television has appeared in some studies to be slightly inferior to live performance by the same lecturer (although it should be mentioned that U.S. Army studies show that some instructors are more effective through the glass screen than in face to face teaching).

Some instructors are more effective with abler students, others more so with the poorer students. But many of the students reported no significant differences in the relative effectiveness of the various teaching methods. For example, a survey of the literature published to 1937 concluded that in subject matter mastery one method of teaching is as good as the other. Similar early research showed that the lecture method was better for immediate recall of fact and for superior students; but **discussion** was better for delayed recall of fact, and for the less able students.

The morale of a lecture class tends to be higher than that of a **discussion method** class: the discussion groups tend to **feel** they have learned little as compared with a lecture class. On the other hand there seems to be some evidence that the discussion or more unstructured type of teaching may be more conducive to developing long term motivation.

Thus research has not definitely shown that the lecture method is surpassed by any other method under all circumstances and for all types of material to be learned. Rather it tends to indicate that the lecture, used wisely **in conjunction with** all the other methods of discussion, project, independent study, laboratory, etc., can be most effective.

So let's now look at the lecture itself. The pertinent research done on the lecture has been summarized in an article published by Verner and Dickinson at Vancouver, Canada. These are some of the findings:

1. Class size has not been found to be a significant variable.
2. Note taking was shown in two studies to be significant to recall, but in four studies not to be significant.
3. The higher the cultural level of the student the greater his ability to profit from the lecture.
4. Repetition of important points is more effective than pauses, loudness, and gestures.

5. Reading a lecture is not as effective as speaking extemporaneously.
6. Meaningfulness of material is important as well as style of delivery. Excessively long sentences lose attention, and comprehension declines as speed of delivery increases.
7. Length of lecture is an important factor; learning begins to diminish after 15 minutes. A study reported by Frost (1967) on the occasion of a "lecture given by a brilliant scholar with an outstanding topic and a highly competent audience" showed the following: Some 10 percent of the audience showed signs of inattention within 15 minutes. After 18 minutes one-third of the audience and 10 percent of the platform guests were fidgeting. At 35 minutes everyone was inattentive; at 45 minutes, trance was more noticeable than fidgeting; and at 47 minutes, some were asleep and at least one was reading! A casual check 24 hours later revealed that the audience recalled only insignificant details, and these were generally wrong!

The Good Lecture

Taking into account then all these things, I'd like to conclude by submitting to you a model of a good lecture and discuss a few ways in which it can be best utilized:

1. First and foremost, it is used to inspire the students to read and study, and to interpret for and guide them, and never for the sole purpose of giving them mountains of factual material which can be learned through reading.
2. It has a simple but well-organized lecture plan with few (3-6) major points.
3. It is brief, interesting, and relevant.
4. It has abundant illustrations to back up all major points, which are understandable and meaningful to the students.
5. It is delivered in a clear voice with use of good English.
6. It is well-spiced with humor or at least is enthusiastically delivered, in interested, conversational tones; the lecturer talks to the students, not at them.
7. It avoids digression, but allows pauses for reaction.

Recommendations and Conclusions

To allow proper use of this kind of lecture, and to allow our students to obtain something more closely related to a true education, I feel that some rather drastic changes are needed. Students presently take **far** too many courses each quarter, and in each one spend far too much time in formal classes (lectures as well as labs). How can a student possibly read widely and in leisurely fashion in seven different subjects in which he has to spend upwards of 20 hours a week sitting and listening to professors deluging him with facts and having to take copious notes; furthermore, with an average of one test

every two or three weeks per class, he averages one test every two days or so, for which he has to scramble just to be able to give back enough facts.

I purpose therefore the following:

1. That lectures be cut to 30 minutes.
2. That the number of one, two, and three credit courses be drastically cut, with condensation into broader units.
3. That five and six credit courses be required to meet only three times per week; that three and four credit courses meet only twice per week.
4. That students be allowed to graduate with, say 120 credits — equal to 10 credits per quarter or two five-credit courses per quarter.

In this way, the student would have the necessary time to spend reading in the library and studying in-

dependently and could pursue a real education; the professor, relieved of the burden of up to 12 lectures per week, would have time for reflection, research, and for individual tuition of students and informal teaching. He would have the opportunity to become that person described by Frank Lloyd Wright when he said, "The teacher who combines powers of creative vision, of imagination, of intellect, of sympathy with human need, and the power to interpret these in a language vernacular and true is the real teacher who shall create poems in human beings."

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TEACHING AWARD RECIPIENT

My Philosophy of Teaching



Robert R. Shrode

This statement might be more accurately titled: "Rambling Thoughts Concerning Teaching", but it is hoped that a reader may, from this verbalization of such thoughts, acquire an impression as to what my "teaching philosophy" is.

First, I would like to emphasize that I use the term **teacher** only because it is short and widely used. I prefer the phrase **leader in learning** to refer to one who conducts a class in what I consider the optimum manner. I agree whole-heartily with the often-quoted statement credited to Galileo: "You cannot teach a man anything. You can only lead him to find it within himself."

During twenty years as a student and nearly as long as a teacher, critical observation of many teachers of all degrees of competence has led to the evolution of what I call a set of ten guidelines for a teacher to review constantly and in accordance with which to assess his performance as a teacher if he desires to improve his teaching effectiveness. I shall list these ten statements and give a few sentences of elaboration and explanation concerning each statement.

1. **Students as people are equals of the teacher.**

The classroom situation should not be different from any other in which I find myself. I am not competent, nor is any other human, to make judgements as to the personal worth of anyone. Ethically speaking, the only proper assumption on which to proceed is the assumption of equality.

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