Using telelectures to expand the agricultural classroom[1]

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ABSTRACT

Students in large on-campus lecture courses have limited opportunities to discuss agricultural problems with non-resident specialists. Telelectures may be an effective method of expanding the agricultural classroom to off-campus specialists. Telelectures, as a supplement to course instruction, were evaluated in crop production courses at two universities. Student ratings indicated that telelectures were a valuable asset to the course and three to four telelectures per term were desirable. Telelectures should be accompanied by slides with adequate time for student-speaker interaction after the formal presentation. The format of a 21 to 40-min formal presentation followed by 6 to 15 min of student-speaker interaction appeared most desirable.

Additional index words: **Telephone, Teleconferencing, Instructional supplement.**

THE use of the telephone as a teaching tool is not new; however, few studies have documented its value in on-campus classrooms. The University of Wisconsin, Division of Educational Communications, pioneered the use of the telephone in education in the early 1960's. The term "telelecture" was derived from these early efforts and refers to the instructional use of telephones equipped with an external speaker(s) and remote microphones (6). Telephone calls can be made during classtime to a resource person, allowing verbal interaction between the speaker and class members. Major telelecture use has been in extension and continuing education. Studies have shown that telelectures reduced program costs, increased the availability, and decreased the time and travel of the speaker (1, 2, 6, 7).

Studies measuring the academic achievement of students instructed by telelecture vs. the traditional on-campus lecture course have shown no significant differences in the amount of student learning (2, 3, 4, 7). However, telelecture was the only teaching medium in the telelecture courses and the audience was mostly adult. Hoyt and Frye (5) reported that students who were successful in telelecture classes were more self-reliant and independent than those who were successful in traditional on-campus classes. More information is needed on the value of telelectures as a supplement to on-campus classroom teaching with a college-age (18 to 24 years old) audience.

Effective methods to enhance student learning in large lecture sections are difficult to devise. Furthermore, opportunities for students to actively discuss specific agricultural topics with off-campus specialists are limited. The purpose of this study was to expose students to off-campus specialists through telelectures and to evaluate telelectures as a teaching supplement in on-campus courses on crop production.

METHODS AND MATERIALS

During 1976–78, telelectures were used as a teaching supplement in four undergraduate crop production courses. Two courses were taught at the University of Florida and two similar courses were taught at Purdue University. All courses were in lecture or lecture-laboratory format.

Telelecture topics were selected which supplemented course material previously presented in the classroom. Selected speakers were contacted approximately 2 months prior to the actual telelecture and asked to prepare slides for their topic. Slides were sent to the course instructor so the class could view them during the telelecture. The speaker either retained a duplicate slide set or kept notes which were used during the telelecture. The course instructor then changed slides during the presentation on cue from the telelecture speaker.

Telelecture equipment was obtained from audio-visual services in both universities. The small telelecture unit consisted of a telephone equipped with an external speaker and two remote microphones which could be extended into the audience (Fig. 1). For the telelecture, speakers were reached through ordinary telephone call procedures. The telelecture topics chosen in this study were designed to expand the student's awareness of agriculture production in the United States and supplement on-campus lectures. Telelecture topics included:

1) Agriculture in Southern Indiana
2) Corn and Soybean Production in the Midwest
3) Farming in the Hard Red Spring Wheat Region
4) Irrigated Corn Production Systems
5) Cotton Production in the Mississippi Delta Region
6) Crop Production Environment of the Texas High Plains

During the 2-year period, 12 telelectures were given over 7 terms in 4 crop production courses. The number and topics of telelectures varied with each term and university. Identical student evaluation forms were used for each term at both universities. Students evaluated various items on the question-

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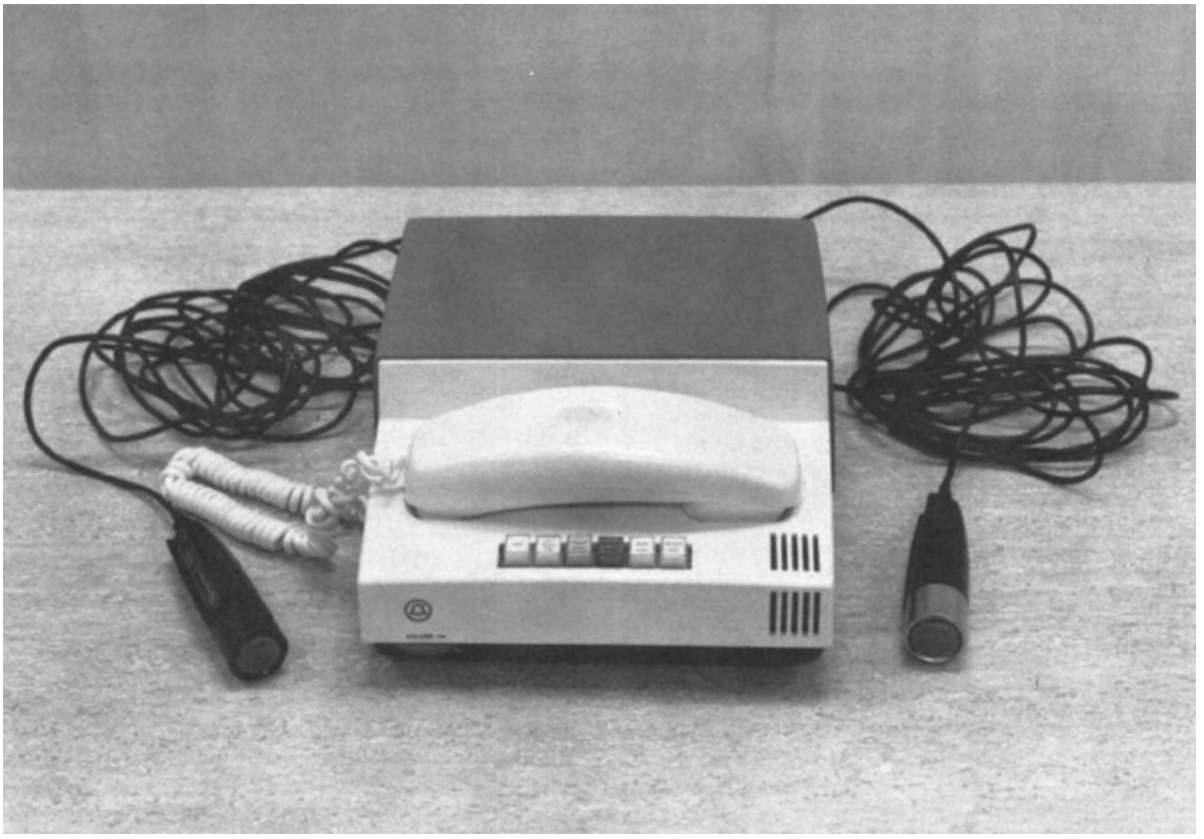

Fig. 1. Photograph of telephone equipment used during telelecture.

naire using the following numerical ranking:

1. Poor, Disagree
2. Adequate, Average
3. Good, Agree
4. Outstanding, Strongly Agree

All data are reported in percentages and are based on a combined total of 283 students from both universities. Approximately 90% of the students sampled were between 18 and 24 years of age.

RESULTS AND DISCUSSION

Eighty-four percent of the students either agreed or strongly agreed with the statement that telelectures were a valuable asset to the course (Table 1). Effectiveness of student learning, in terms of learning retention, was not measured in this study; however, previous studies have shown that telelectures were as effective as "live" presentations in learning retention (3, 4). Apparently, telelectures were valuable to students in supplementing traditional on-campus courses in crop production.

The majority of students strongly agreed that a formal, organized presentation was essential, and 90% of the students either agreed or strongly agreed that slides were beneficial during the telelecture (Table 1). These results indicated the importance of speaker preparation and of visual supplement to the telelecture. An inherent limitation in the telelecture without slide presentation is the lack of visual aids in supplementing student learning and the consequent dependence on audio stimulation to maintain student interest. Parker et al. (6) stated that 12 to 15 min is the approximate time span adults are able to concentrate on a solitary audio message. Therefore, telelectures longer than 12 to 15 min should be supplemented with visual aids. Written handouts may be more effective than slides in some situations (1).

Speaker preparation is important because of the increased reliance on the audio stimulation by the telelecture speaker in maintaining student interest. Adequate speaker preparation prior to telelecture minimizes long pauses during which students do not receive any audio or

Table 1. Student evaluation of telelecture format

Statement	Student response (%)				
	Rating				No response
	1	2	3	4	
Telelecture was a valuable asset to the course	2.5	11.7	58.0	26.1	1.7
A formal, organized presentation was essential	0.0	2.8	29.7	66.4	1.1
Slides were beneficial during telelecture	0.7	4.2	55.1	35.3	4.7
Time for student questioning after the presentation was essential	8.8	16.3	46.6	17.7	10.6

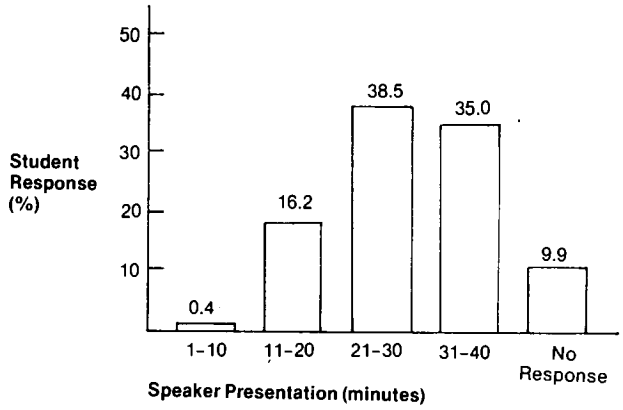

Fig. 2. Student response regarding most desirable length of time for speaker presentation during telelecture.

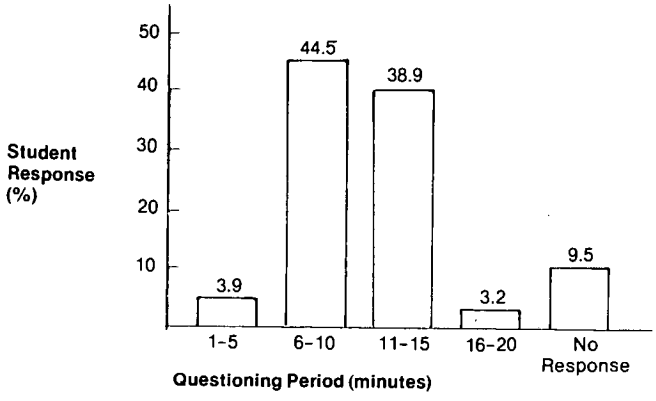

Fig. 3. Student response regarding most desirable length of time for student questioning during telelecture.

visual stimulation. During telelecture presentations, the authors noted that speakers who maintained a reasonably rapid pace and provided more slides maintained better student interest than slower-paced speakers or those with few slides. Speakers who maintained better student interest used 2 to 4 slides/min during their presentation. Generally, students felt that speaker presentations should last 21 to 40 min (Fig. 2).

Sixty-four percent of the students either agreed or strongly agreed that student questioning after the telelecture presentation was essential (Table 1). Eighty-three percent of the students felt that a minimum of 6 and a maximum of 15 min were needed for student questioning (Fig. 3). Apparently, student-speaker interaction was necessary for effective telelectures. Students were reluctant to ask questions at the beginning of the questioning period; however, student questioning increased as they became more acquainted with the teaching techniques and expressions of the speaker. The course instructor can be very effective in facilitating student-speaker interaction and encouraging student-speaker discussion. Students felt more relaxed and questioning increased when a picture and a brief background of the speaker was provided prior to the beginning of telelecture. The telelecture speaker may also encourage student-speaker interaction with an informal, enthusiastic, and lively presentation (6).

Table 2. Student evaluation of telelecture equipment

Entry	Student response (%)				
	Rating				No response
	1	2	3	4	
Volume and clarity of equipment	1.8	22.6	51.6	14.5	9.5
Student access to microphones	5.0	30.7	43.8	14.1	6.4
Overall rating of equipment	0.4	18.7	57.6	16.2	7.1

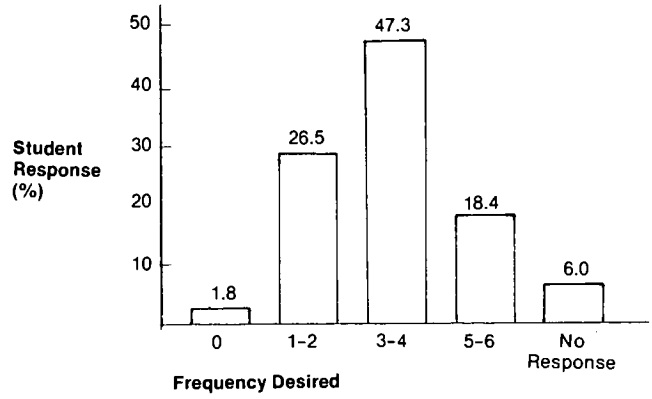

Fig. 4. Student response regarding frequency of telelectures desired per term.

Overall ratings of telelecture equipment indicated that 74% of the students felt equipment was either good or outstanding. Sixty-six percent of the students felt that the volume and clarity of equipment were good or outstanding and 58% felt that student access to remote microphones was good or outstanding (Table 2). Student ratings of equipment volume and clarity, and of microphone accessibility may be related to class size and classroom environment. In this study, class size varied from 20 to 90 students. Large class size, poor classroom acoustics, and increased noise levels may limit equipment effectiveness. For classes with a minimum of 70 students, additional external speakers and microphones may be necessary.

Ninety-two percent of the students wanted telelectures to be used during the course. The percentages of students desiring 3 to 4 and 5 to 6 telelectures to be presented per term were 47% and 18%, respectively (Fig. 4). These results indicated that telelectures as a supplement to course material were well-received by students; however, extensive use may reduce the effectiveness of telelectures as a teaching method. None of the students had experienced telelectures in prior classes and the novelty of the experience may have inflated student ratings and influenced the frequency of telelectures desired by students.

The full potential of telelectures in on-campus agricultural instruction has not been realized. Telelectures when used as a supplement to traditional instructional methods expose undergraduate students to specialists in different areas of the United States. Telelectures also may be very effective in graduate level courses by allowing graduate students to discuss current research with both industrial and university research specialists at remote locations. The lecture-question format was used in this study; however, alternative telelecture formats such as interviews, panel discussions, and reactor panels may be effective in other classroom situations.

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