

A CASE STUDY

Faculty Utilization of Instructional Methods and Media

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Introduction

The University of Minnesota has been one of the pioneers in the development and utilization of audiovisual materials, equipment, and techniques for the teaching/learning process. In 1871, the first course catalogue reported the use of departmental museums for teaching resources. By the 1879-80 school year there were three museums, a General Museum, a Museum of Technology and a Museum of Agriculture. As early as 1889 photographic equipment was being used to produce teaching materials. In 1911, photography was a line item in the College of Agriculture budget. In the summer of 1918, the first labeled course in visual education in America was taught at the University of Minnesota by the Department of Agricultural Education. About the time of World War I, motion pictures were being produced for use by the University. During the 1930's, a university-wide instructional resource unit was established, and the American Council on Education and the Rockefeller Foundation selected the University to conduct experiments in audiovisual techniques and to produce films specifically for use at the University level. Motion pictures developed from this project became benchmarks for the utilization of specifically produced films for the university classroom.

During the 1940's, a number of studies were conducted at the University concerning the production, utilization, and administration of audiovisual materials, equipment, and techniques. In 1944, educators were concerned specifically with how teaching materials were being produced and utilized, and if there was a need for in-service training. This study was repeated in 1948 and 1961. In all of these studies the adjacency, convenience, cost, and time factors were identified as vital to the effective utilization of resources. The need for central support services for both production of materials and instructional design and development was also indicated. The University's Central Resource Unit used this data to establish its objectives in meeting the needs and goals of resident instruction and to facilitate the reorganization of the university-wide resource function. As a result, a number of the resource units were combined and added to strengthen and unify the program on the University-wide level. The reorganization study also recommended, when feasible, the establishment of learning resource centers at the college or departmental level. This was in

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response to the adjacency, convenience, cost, and time factors identified as deterrents to usage. These sub-units developed as to the specific needs of the area represented. Early in the reorganization process it was also determined that the instructional development and design process should be carried out within a field or discipline. The University-wide development function was established primarily as a funding and priority setting support unit. Development and design activities within a common field of study were found to stem from a more realistic need in meeting the instructional objectives. It was also observed that implementation of the results of the development process would be more widely accepted and utilized when it was generated from within. The need for the instructional resource development process to be within a field of study or discipline was really evident in the late 1800's when departmental and college museums or laboratories were initiated to support the teaching-learning function.

Over the years the academic service units grew in number, size, and complexity. As a result, there was and is a continuing need for program evaluation to best determine the functions of the total instructional resource program and its many segments.

The following study is a continuation of this evaluation process as carried out by one segment, the Instructional Development Laboratory of the College of Agriculture at the University of Minnesota. The purposes of this study are 1) to determine the extent to which instructional methods and instructional media and technology are being used by its faculty members, 2) to identify specific obstacles in the use of instructional media and technology, and 3) to identify some felt needs of the faculty relating to resources and their development. The faculty questioned by this study have access to the resources and services listed in the study from either their departmental holdings or from the college learning resource centers and the University Central Services.

Procedures

During the Fall Quarter 1980 the Instructional Technology Questionnaire was sent to all 375 faculty members with the rank of assistant professor or above in the Institute of Agriculture, Forestry, and Home Economics. One hundred and fifty-seven (42%) completed questionnaire forms were received by the deadline date of October 15.

Initially, the data were analyzed by computing frequencies and percentages of each item. Next, academic discipline categories were created using academic focus

Table 1. Distribution of Respondent by Academic Disciplines.

	Number	Percent
1. Plant and Soil Technology	24	15.6
2. Animal Technology	40	26.0
3. Horticulture and Forestry	26	16.9
4. Applied Social Science	31	20.1
5. Home and Food Technology	33	21.4
Total	154	100.0

as a basis for classification of disciplines. These categories include Plant and Soil Technology, Animal Technology, Horticulture and Forestry, Applied Social Science, and Home and Food Technology. Using SPSS/ONLINE Version 80, chi-square analyses were computed for each item to determine differences among academic discipline categories.

Materials and Methods

The Instructional Technology Questionnaire was developed by members of the Laboratory for Research in Scientific Communication and the Instructional Development Laboratory, University of Minnesota, St. Paul. The questionnaire consists of both cognitive and attitudinal items. The questionnaire also asked respondents to indicate the average class size and physical setting of classes.

The following research questions were addressed:

1. What are the frequencies and percentages of uses of methods of instruction, uses of types of instructional media, attitudes toward use of audiovisual materials, perceived obstacles in the use of instructional technology, experiences in using instructional technology, and needs in operating instructional equipment and in developing instructional materials for faculty members in the Institute of Agriculture, Forestry, and Home Economics?
2. Are there significant differences among members of different academic discipline categories (Plant and Soil Technology, Animal Technology, Horticulture and Forestry, Applied Social Science, and Home and Food Technology) in uses of methods of instruction, uses of types of instructional media, attitudes toward use of audiovisual materials, perceived obstacles in the use of instructional technology, experiences in using instructional technology, and needs in operating instructional equipment and in developing instructional materials?
3. What are the rankings among academic discipline categories in uses of methods of instructional media, attitudes toward use of

Table 2. Distribution of Respondent's Use of Methods of Instruction N = 154.

	Total number of instructors using this method	Percentage of total number
1. Lecture	151	98.1
2. Discussion	116	75.3
3. Demonstration	75	48.7
4. Field Trip	60	39.0
5. Discovery	41	26.6
6. Team Teaching	37	24.0
7. Inquiry	36	23.4
8. Individual Instruction	35	22.7
9. Self Instruction	35	19.5
10. Combining Media	29	18.8
11. Seminar	26	16.9
12. Group Instruction	24	15.6
13. Computer-Assisted Instruction	14	9.1
14. Games	14	9.1
15. Simulation	14	9.1
16. Programmed Instruction	6	3.9

Table 3. Respondents' Use* of Instructional Resources (N = 154)

	Number	Percent
1. Chalkboards	131	85.1
2. Printed materials	130	84.4
3. Overhead transparencies	107	79.4
4. Maps, charts, diagrams	89	57.8
5. Slides	87	56.5
6. Specimens, models	61	39.6
7. Photographs	44	28.5
8. Motion pictures	25	16.2
9. Demonstration boards	16	10.3
10. Videotapes	16	10.3
11. Audiotapes	13	8.4
12. Computers/terminals	12	7.8
13. Microphones/PA system	8	5.2
14. Filmstrips	6	3.8
15. Records	1	0.6
16. TV programs	1	0.6

*Respondents use item at least once a month.

Table 4. Percentages of Respondents Favoring the Use of All Materials and Devices (N = 154)

	Percent
1. Disagree with "AV materials and devices may be fine for other instructors, but personally I have little use of them."	81.2
2. Disagree with "AV materials and devices take up too much class time and do not leave time to cover the text material."	80.6
3. Agree with "I believe AV materials and devices make a substantial contribution to the education of my students."	79.3
4. Agree with "If given sufficient personnel and financial assistance, I would like to supervise the preparation and evaluation of AV materials and devices for my class."	62.3
5. Disagree with "Most AV materials and devices that have come to my attention are unsuited for college use."	60.4
6. Agree with "AV materials and devices should be frequently used in college teaching in order to meet the problem of increasing class size."	55.9

audiovisual materials, perceived obstacles in the use of instructional technology, and needs in operating instructional equipment and in developing instructional materials?

Results

The results of this study are reported in Tables 1 through 7. Table 1 shows the frequencies and percentages of respondents classified according to five academic discipline categories.

Table 2 reveals that the four primary methods of instruction are lecture, discussion, demonstration, and field trips. Table 3 indicates that more than half of the respondents utilize chalkboards, printed materials, overhead transparencies, maps, charts, diagrams and slides as instructional resources.

Table 4 also reveals much variance on dependent measures. The findings indicate that faculty members have a positive attitude towards the use of audiovisual materials and devices, indicating that these materials and devices can contribute substantially to education and should be used by instructors.

Other findings reveal that the primary deterrents to instructors using instructional technology were (i) lack of

time to locate or obtain good materials, (ii) lack of suitable materials in the field, and (iii) lack of technical assistance to prepare or to make instructional materials. Access to technology was not a major deterrent. In addition, the respondents have the most experience in operating an overhead projector and slide projector, and in preparing or making overhead transparencies, charts, diagrams, and posters. They expressed the most need for instruction and technical service assistance in operating computers/terminals and videotape recording system. They also indicated that they would like instruction and technical service assistance in preparing or making videotapes and slides. The breakdowns of these results are presented in Table 5 through 7.

Other results indicate that student instruction was generally held in classrooms (82.5%), laboratories (29.9%), field experience areas (19.5%), or auditoriums (18.8%). Respondents reported average class size of 10 to 20 students (22.7%), 21 to 30 students (22.1%), or more than 50 students (also 22.1%). Most of the respondents (92.9%) reported that they used their own material collection for teaching. Other types of materials collection used were department collection (38.3%), university collection (16.9%), and commercial/professional collection (14.9%). About a quarter of the respondents (26.0%) said they were quite familiar and more than half (55%) said they were somewhat familiar in their fields.

Discussion

The results of this study indicate that a majority of the respondents still use the traditional methods of instruction, e.g., lectures and discussions. They use such standard instructional resources as chalkboards, printed materials, maps, charts, and diagrams which have been used for a long time and are widely accepted in college teaching. In addition, over 50 percent used the "newer" formats e.g., overhead transparencies and slides but few used the more advanced instructional technology, e.g., television, computers/terminals, and videotapes.

Table 5. Percentages of Respondents Reporting Deterrents to Using of Instructional Technology (N = 154)

	Percent
1. Not enough time available to locate or obtain good materials.	69.5
2. Lack of suitable instructional materials in my field.	66.9
3. Lack of technical assistance to aid in preparing or making materials.	55.2
4. Lack of technical skills in preparing or making instructional materials.	53.2
5. Lack of information on existing college materials.	43.5
6. Inconvenience in setting up equipment.	40.2
7. Materials, equipment, or operators are not available when needed.	38.3
8. Lack of reliable and easy-to-use equipment.	37.7
9. Lack of adequate physical facilities for presenting materials.	35.7
10. Lack of training in proper use of instructional materials and devices.	35.0
11. Facilities to produce materials are located too far away.	31.8
12. Lack of technical skills in selecting and evaluating instructional materials.	30.5

Table 6. Respondents Experiences, Instructional Needs, and Technical Services Needs in Operating Devices. (N = 154, figures in percent)

Operating	Have experience	Need instruction	Need aide
Presentation board	35	11	6
8 or 16mm film projector	75	3	4
Filmstrip projector	61	1	
Audiotape recorder/player	68	7	3
Slide projector	95	1	0
Overhead projector	97	1	0
Opaque projector	75	2	1
Computer/terminal	40	20	16
Videotape recording system	33	17	12
35mm camera	79	5	1
Motion picture camera	40	8	6

Table 7. Respondents' Experiences, Instructional Needs, and Technical Services Needs in Preparing or Making Materials. (N = 154, figures in percent)

Preparing or Making	Have experience	Need instruction	Need aide
Slides	77.3	11.7	14.9
Photographs	71.4	7.1	9.7
Overhead transparencies	90.9	9.7	8.4
Spirit master for duplication	46.8	3.9	5.8
Audiotape recordings	55.8	7.1	5.8
Charts, diagrams, posters	81.8	5.8	9.7
Videotapes	28.6	17.5	16.9
Filmstrips	11.0	7.1	7.8
8 or 16mm films	26.6	8.4	7.8
Microforms	1.9	9.7	9.1

The findings also indicate that the classroom is still the dominant physical setting for instruction. Other common settings include laboratories, field experience areas, and auditoriums. This is reflected in the reported average class size ranging from 10 to more than 50 students. On the other hand, only a few respondents said they used the library/learning resources center or studio/media classrooms which include individualized instruction and other media-oriented learning laboratories.

A general observation is that the respondents have favorable attitudes toward the use of audiovisual materials and devices to improve teaching and to meet the problems of increasing class size. In addition, if given sufficient personnel and funds, respondents favor supervising the preparation and evaluation of instructional materials and devices for their classes.

The results also reveal that almost all the respondents use their own material collection for teaching. More than 80 percent are familiar with commercially produced instructional materials and devices in their fields, but are unable to devote the time necessary to locate or obtain good materials. Other deterrents include the lack of suitable materials, lack of technical assistance to aid in preparing materials, and lack of technical skills in preparing materials. The newer electronic resources, e.g., television and computers lack wide usage, but there is a felt need for method and technical assistance in this area. There is a need for more training in the use of the newer instructional technology.

Other results of this study indicate there were limited differences between group variances and more within group variances in marking individual items for each dependent measure. Tables 2 through 7, however, reveal that there were differences among faculty preferences in rating various items: uses of methods of instruction, uses of instructional resources, attitudes toward use of audiovisual materials and devices, perceived deterrents, experiences and needs in operating equipment and devices, and in preparing instructional materials. Thus, faculty members have different perceptions concerning individual items within categories of instructional technology.

Each academic discipline category has certain potential strengths and weaknesses. For example, members of the Plant and Soil Technology Group and Animal Technology Group utilize most instructional resources, while members of the Horticulture and Forestry and Home Food and Technology utilize most methods of instruction, and members of the Applied Social Science Group have the most favorable attitude toward audiovisual equipment but need the most assistance in operating equipment. These results suggest that each group has certain skills that need to be shared with other groups.

Conclusion

This study was designed to gather information about habits, attitudes, preferences, and needs of faculty members. The findings as identified will be used to set the goals and objectives of the Instructional Development Laboratory that recently moved into its new facility. The facility includes three media classrooms, equipped with the latest presentation and recording technology, including television and telelecture. The classrooms are used for regularly-scheduled classes that require media support. They are also used as training facilities for faculty and graduate students to improve their communication and teaching skills. The Laboratory initiates and promotes workshops and seminars related to teaching and learning resources and methods, e.g., microcomputers as an instructional tool. Along with the in-service function there is a materials development laboratory for the faculty and graduate students to assist them in identifying and producing resource materials in meeting their specific teaching-learning needs. For example, slide sets are developed for use in the classroom and in the individualized learning laboratories. The facility is located in the new Central Library of the St. Paul Campus and through networking relationships supports and provides guidance in the utilization of the library's nonprint distribution system for resident instruction. The limitations so far have been program support funds, for as in most large institutions the education dollar is limited. In retrenchment periods instruction returns to the basics and teaching-learning resources assume the luxury syndrome. We hope to identify through the Instructional Development Laboratory and studies such as this one the priority resource needs of the faculty and resident teaching. We also believe each teacher

should know his tools and techniques of instruction. To know resources is to use them effectively. A do-it-yourself program for resources (with assistance) is one answer to the lack of funds. There is a need for more interaction among faculty members and disciplines relating to the teaching-learning process. There is also the need for coordination and leadership in developing seminars and introducing the faculty to new technology materials and methods. We hope the Instructional Development Laboratory will fill some of these gaps. As in all previous studies at this University, this study reinforces faculty desires to use good instructional alternatives and resources if they are adequately supported with competent personnel and funds.

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Toward Establishing A Record Of Teaching Performance

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Evaluating classroom instruction is continually perplexing and controversial. One can find support in the literature for just about any viewpoint. Seemingly, there is always something to write or talk about whenever teaching evaluation is discussed. See, for example, the articles by Aleamoni, Foth, Moody, Deaver, and Shrode.

As a common starting point, I first suggest that whether teaching can be evaluated is irrelevant. We must evaluate teaching. Second, there are at least two major objectives for evaluating teaching: to use the information to make personnel decisions and to improve teaching quality. Third, at least two items are evaluated during the process: the input resources going into teaching such as instructor characteristics, and the output or student learning that comes about from application of the teaching process.

This paper will describe briefly four main methods of evaluating teaching. Then it makes a case for utilizing several methods of teaching evaluation to establish a record of teaching performance over time. These records can provide sufficient information to distinguish between instructors doing a "good" job and those doing a "poor" job.

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