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ABSTRACT

This paper provides information on the cost of the research underlying the Minicourse model as compared with the development cost of the Minicourse packages. It also estimates the cost that would be involved in achieving 30 percent implementation of Minicourses by elementary and secondary school teachers in the United States. Research costs are estimated on the basis of 11 projects (listed in an appendix) which formed the direct foundation for the development work. Development costs are estimated on the basis of an average of current figures for Minicourses 2, 3, 5, and 8. (An appendix lists the costs of each of the four broken down by the major steps in the development process.) Dissemination and implementation costs are also estimated, mainly on the basis of material and personnel costs. A summary of costs arrives at a figure of $45 for the average cost of one course for one teacher. (RT)

7/15/71 SP

RESEARCH, DEVELOPMENT, AND IMPLEMENTATION COSTS FOR MINICOURSES

by
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INTRODUCTION

Recently a memorandum from Secretary Richardson's office (HEW) identified the Minicourse program as one of three outstanding developments that appeared worthy of national dissemination. His memo also raised the question of the cost that would be involved in achieving 30 percent implementation of Minicourses by elementary and secondary school teachers in the United States. In addition, the Laboratory has received a number of other inquiries regarding the cost of Minicourses, the cost of the research underlying the Minicourse model as compared with the development cost of the Minicourse packages, etc. This brief paper provides information on these costs.

Assumptions. Since estimates of costs depend upon the parameters and assumptions upon which they are based, it is necessary to identify these assumptions at the outset. They are as follows:

1. There are approximately 2.3 million elementary and secondary classroom teachers in the United States. However, since some of these teachers are teaching in areas where appropriate Minicourses are not being developed, other teachers are too close to retirement to make an extensive inservice program feasible, and still other teachers are not likely to become involved in Minicourse training for other

reasons, we are assuming that the inservice target audience for Minicourses consists of 2 million elementary and secondary classroom teachers.

2. Approximately 30 Minicourses will be developed before the program achieves its goal of providing materials to provide each elementary and secondary teacher with a reasonably complete repertoire of basic teaching skills.

3. Although approximately 30 Minicourses will be developed, it is anticipated that, depending on grade level and subject matter specialization, on the average only 8 to 12 Minicourses would be taken by a single teacher. It is anticipated that these 8 to 12 courses would provide the teacher with basic classroom skills relevant to his grade level and subject area specialization. For the purposes of estimation, we are assuming that eight Minicourses would be of substantial benefit to the typical classroom teacher, and, therefore, we have employed this minimum figure.

4. We are assuming that the current Minicourse model will be continued without major deviations. This model involves providing instructional and model lessons on 16mm film and requires the teacher to carry out microteaching lessons and record these on videotape or audiotape recording equipment. We are assuming that the average set of Minicourse films and VTR equipment would be used by 200 teachers over a life span of five years. Since we are now experimenting with changes in the Minicourse model that, if successful, would significantly reduce costs, our present assumptions may lead to overestimating some costs.

Research Costs

For two reasons, it is almost impossible to estimate the total research costs that underlie any development in education. First, we know that each research project builds to a degree on previous research which, in turn, was built on previous research and so on. Thus, estimating total research costs requires reconstructing a long and complex chain of events. In addition to the fact that each research project builds upon previous research, it should also be remembered that a given research project that is of major importance in forming the foundation for the Minicourse instructional model may also be of major importance in forming the foundations for several other important educational developments.

In the case of the Minicourse instructional model, however, it is possible to obtain rather accurate cost figures on the research that forms the direct foundation for our development work. This is because nearly all of the research on microteaching was carried out at Stanford University over a relatively short time span. A careful review of the Stanford research from 1966 to date reveals that a total of $269,000 was expended on research contracts that closely and directly support the Minicourse development. These projects are listed in Appendix A.*

Minicourse Development Costs

Since the Far West Laboratory set up a rather precise cost accounting system early in its history, we have a considerable amount of accurate information on the cost of developing Minicourses. A detailed study has been carried out on the cost of developing four Minicourses, all of which are now completed. These are Minicourses 2, 3, 5, and 8. Appendix B

* These data were provided by Dr. Frank Sobel of the Stanford Center for Research and Development in Teaching.

gives the costs of these four Minicourses broken down by the major steps in the Laboratory's research and development process. We have great confidence in the accuracy of these figures except for costs in the last three steps (excluding miscellaneous). Our operational product revision costs were not all tabulated at the time this table was prepared and it has been our experience that our part in making the final revision, which is released for operational use, is somewhat higher than indicated. Since some additional work has been done in both report preparation and dissemination planning since November of 1970, these two categories are also underestimates. At this point it appears that the average cost of developing these four Minicourses is in the neighborhood of $125,000 rather than $108,000 as shown in Appendix B. Thus, the direct development costs for the 30 Minicourses which will make up our complete basic skills system is estimated at (30 x $125,000) $. 3,750,000

DISSEMINATION AND IMPLEMENTATION COSTS

These cost estimates are based on much less experience than those reported above.* We have drawn upon a considerable amount of field testing and dissemination experience gathered over the past four years in making these estimates but they should still be regarded as much less precise than the information on the research or the development costs.

Dissemination of Information about Minicourses

These costs are incurred, for the most part, to reach the professional gate-keepers or opinion leaders who must accept the Minicourse and give them a professional "stamp of approval" if they are to receive widespread

* These figures, for the most part, have been developed by Dr. C. L. Hutchins, Director of the Utilization Program.

use. We have employed several techniques for reaching these individuals, among which are presentations at professional meetings, journal articles, conferences, promotional literature, correspondence, personal contact, etc. Teacher Education Program expenses for this type of dissemination since 1968 have totaled $118,422. These costs have climbed as the overall program budget increased and as more products are brought to a development level where they could be disseminated. For example, in 1968 program dissemination costs came to $5,510, in 1969 $28,218, and increased to $42,482 in 1970. Through June of 1971 we have expended $42,212 which is an annual rate of about $72,000*. It is anticipated that over the next five years these expenses would come to an additional $500,000, making a total of $618,422.

Demonstrations

Demonstration Centers have been found to be an effective device for acquainting school administrators with innovative educational products. Most school administrators want to see a new product in use and talk with school persons who have used the product. The demonstration center probably fills this need better than any other dissemination median. Our present experience suggests that a single demonstration center can provide demonstrations of up to five Minicourses during a school year. Our estimate cost for setting up and conducting a minimum program of demonstration centers over the next five years is as follows:

1971 Academic Year	Ten demonstration centers giving demonstrations on five elementary school Minicourses. (Based upon a contract we currently have with NCEC)	$ 299,855

* The Laboratory's contract year runs from December 1 to November 30.

1972	Twenty demonstration centers giving demonstrations on five elementary and five secondary Minicourses	$600,000
1973	Twenty demonstration centers giving demonstrations on five elementary and five secondary Minicourses	$600,000
1974	Ten demonstration centers giving demonstrations on five secondary Minicourses	$300,000
Total demonstration cost required to demonstrate 30 Minicourses, each for a period of one academic year		$1,800,000

Implementation Costs

The greatest cost involved in reaching a point where 30 percent of all inservice teachers had completed eight Minicourses would be incurred by local school districts involved in actually conducting the courses.

Material Costs

1. Cost of the Minicourse multi-media packages (2 million teachers x 30 percent x 8 Minicourses divided by 200, i.e., use made of each Minicourse) = 24,000 purchases x $1500 = $36,000,000
2. Cost of teacher handbooks (8 Minicourses x $2 handbook x 600,000 teachers) = 9,600,000
3. Recording tape. Videotape for teachers to record microteaching lessons. The average course requires a 20-minute tape which can be reused in four Minicourses, i.e., 30-50 recordings and replays.
   ($18 per hour x 1/3 hour x 8 Minicourses divided by 4 Minicourses per tape x 300,000 teachers) $ 3,600,000
   ($3 per hour x 1/3 hour x 8 Minicourses divided by 4 Minicourses per tape x 300,000 teachers) = $ 600,000

4. Teacher released time. Since Minicourses involve direct practice with pupils in a microteaching situation, it is usually necessary that the Minicourse be conducted during regular school hours. Although many schools provide the teacher with released time by having an administrator cover the teacher's class, covering the teacher's time through a team-teaching arrangement or other such techniques, many school districts employ substitutes to release teachers taking the Minicourse for one hour a day. In the following figures we have assumed that the teacher requires the equivalent of about 1 1/2 days of released time to complete those parts of the Minicourse that must be carried out during regular school hours. There is a trend in our more recent courses to reduce the amount of released time needed by the teacher. If this trend continues, the average Minicourse will probably require the equivalent of about 1 day of release time rather than 1 1/2. We have also assumed that approximately half of the school district using Minicourses will release the teacher using methods that incur no extra costs while half will employ substitutes. (1 1/2 days per teacher x $30 per day x 8 Minicourses x 300,000 teachers) $108,000,000

5. Course coordinators. Although Minicourses are almost entirely self-taught, a course coordinator is needed to set up schedules, see that equipment remains in working order, etc. We estimate that in the average school situation about 2 hours of the coordinator's time is required for each teacher taking a Minicourse. (2 hours x $5 per hour x 8 Minicourses x 600,000 teachers) $ 48,000,000

6. Recording equipment. At this time most of the Minicourses we have developed employ videotape equipment for recording the teacher's performance in microteach lessons. However, we have conducted one study that indicates that audio tape equipment is equally effective for certain kinds of teaching skills. In the following estimate we have assumed that half of the Minicourses would employ videotape feedback and the other half audiotape feedback. There has also been a strong trend in recent years towards reducing the costs of videotape recording equipment. Our estimates assume that this trend will continue. (12,000 VTR systems x $700) $ 8,400,000

(12,000 audiotape recording systems x $200) $ 2,400,000

SUMMARY OF COSTS

1.	Direct research foundations for Minicourse development	$ 269,000
2.	Direct development costs for 30 Minicourses	3,750,000
3.	Dissemination of information on Minicourses	618,422
4.	Demonstration Centers	1,800,000
5.	Implementation of 8 Minicourses for 600,000 teachers	$216,600,000
6.	Total cost to train 600,000 teachers, 8 Minicourses	$223,037,422
7.	Average cost per teacher trained (8 courses)	$ 356
8.	Average cost of one course for one teacher	$ 45*

* It should be noted that completion of one Minicourse is regarded by colleges and universities that use these courses as equivalent to approximately 3 quarter hours of upper division graduate credit. Most college courses cost far in excess of $22.50 per quarter hour and offer no evidence of effectiveness that compared with the performance evaluations made on Minicourses.

APPENDIX A

RESEARCH FOUNDATIONS UNDERLYING THE MINICOURSE INSTRUCTIONAL MODELS

		Start	Complete
Allen & McDonald, Project # 5-1030 Training effects of feedback and modeling procedures on teaching performance: 1. reinforcement 2. reinforcement viz a viz massed versus distributed practice 3. probing	$81,000	3/66	6/30/66
Allen, McDonald, Berliner & Sobol Training effects of feedback and modeling procedures on teaching performance: Stimulus Variation Stanford Center #5-0252	22,000	3/66	6/66
Allen, McDonald, Sobol & Berliner Training effects of feedback and modeling procedures on teaching performance: Silence Stanford Center #5-0252	20,000	7/66	10/66
Allen, McDonald, Berliner & Sobol Training effects of feedback and modeling procedures on teaching performance: Higher Order Questioning (secondary school teachers) Stanford Center #5-0252	25,000	7/66	10/66
Allen & McDonald Training effects of feedback and modeling procedures on teaching performance: Control of Small Group Discussions Stanford Center #5-0252	23,000	10/66	1/67

		Start	Complete
Allen, McDonald and Karen K. Klaus		1/67	4/67
Training effects of feedback and modeling procedures on teaching performance: Higher Order Questioning (elementary school teachers) Stanford Center #5-0252	$20,000		
Allen, McDonald and David Young		7/67	10/67
Training effects of feedback and modeling procedures on teaching performance: Lecturing Skills Stanford Center #5-0252	25,000		
Allen, McDonald and John Koran		9/67	12/67
Training effects of feedback and modeling procedures on teaching performance: Inquiry Skills Stanford Center #5-0252	18,000		
McDonald and Marylou Koran, Project # 8-1073		9/68	5/69
Effects of individual differences on observational learning in the acquisition of a teaching skill: Analytic Questioning	15,000		
Richard E. Snow and McKnight		7/69	12/69
Training effects of feedback and modeling procedures on teaching performance: Listening Skills Stanford Center #5-0252	10,000		
Richard E. Snow and R. Lundgren		7/69	not finished
Training effects of feedback and modeling procedures on teaching performance: Listening Skills Stanford Center #5-0252	10,000		

APPENDIX B

FAR WEST LABORATORY FOR EDUCATIONAL RESEARCH AND DEVELOPMENT

TEACHER EDUCATION PROGRAM

DIRECT COSTS OF MAJOR STEPS IN THE MINICOURSE DEVELOPMENT CYCLE
(As of November 30, 1970)
(Table 1)

	Mini-2	Mini-3	Mini-5	Mini-8	Mean
Conceptualization and Planning	$ 6,648.08	$ 4,009.57	$ 11,790.94	$ 6,156.02	$ 7,151.15
Preliminary Product Development	14,866.37	22,926.22	19,827.14	14,663.60	18,070.83
Preliminary Product Testing	4,110.40*	4,305.99	6,243.91	2,055.20	4,178.87
Preliminary Product Revision	31,717.74	15,249.22	22,694.56	24.309.04	23.492.64
Main Product Testing	33,635.52	40,964.69	27,716.37	16,040.69	29,589.31
Main Product Revision	3,443.09	4,796.29	1,913.51	10,204.28	5,089.29
Operational Product Testing	2,837.64	4.317.66	18,566.59	4,295.14	7,504.25
Operational Product Revision	3,187.29	13,816.85	5,189.87	1,733.50	5,981.87
Report Preparation	1,545.25	2,331.50	2,600.76	2,712.78	2,297.57
Dissemination Planning	2,182.59	3,722.42	3,356.56	867.65	2,532.30
Miscellaneous	583.04	1,736.58	5,535.50	286.80	2,036.48
TOTALS	$104,757.01	$118,876.99	$125,435.71	$ 83,324.70	$108,098.60

* This course underwent two preliminary field tests.

FAR WEST LABORATORY FOR EDUCATIONAL RESEARCH AND DEVELOPMENT

TEACHER EDUCATION PROGRAM

PERSONNEL COSTS OF MAJOR STEPS IN THE MINICOURSE DEVELOPMENT CYCLE
(As of November 30, 1970)
(Table 2)

	Mini-2	Mini-3	Mini-5	Mini-8	Mean
Conceptualization and Planning	$ 5,346.82	$ 3,440.77	$10,030.60	$ 4,952.59	$ 5,910.82
Preliminary Product Development	12,078.22	17,131.77	16,284.64	11,875.72	14,342.58
Preliminary Product Testing	1,846.18	2,483.26	2,977.94	923.09	2,057.61
Preliminary Product Revision	26,089.99	12,282.98	17,863.69	18,828.64	18,766.32
Main Product Testing	19,532.03	31,339.60	19,553.77	10,089.74	20,128.78
Main Product Revision	2,869.34	3,830.23	1,697.80	8,856.73	4,313.52
Operational Product Testing	2,078.91	3,851.01	13,738.84	2,996.50	5,666.31
Operational Product Revision	2,451.41	10,656.65	3,946.80	1,372.20	4,606.76
Report Preparation	1,294.53	1,801.98	2,027.12	2,231.34	1,838.74
Dissemination Planning	1,608.58	2,978.45	2,508.29	704.92	1,950.06
Miscellaneous	399.00	1,423.27	5,443.53	259.01	1,881.20
TOTALS	$75,585.01	$91,219.95	$96,073.02	$63,090.48	$81,494.61

FAR WEST LABORATORY FOR EDUCATIONAL RESEARCH AND DEVELOPMENT

TEACHER EDUCATION PROGRAM

MINICOURSE COSTS IN MAJOR BUDGET AREAS
(As of November , 1970)

(Table 3)

	Mini-2	Mini-3	Mini-5	Mini-8	Mean
Personal Services	$ 75,585.01	$ 91,219.95	$ 96,073.02	$ 63,090.48	$ 81,492.12
Transportation and Per Diem	4,677.46	3,706.77	3,007.03	2,884.93	3,569.05
Rent & Utilities	6,435.54	8,256.76	9,994.34	5,551.52	7.559.54
Communications	1,349.97	1,393.54	1,570.78	1,208.79	1,380.77
Printing & Reproduction	734.19	1,018.80	1,032.30	720.07	876.34
Other Services	1,927.69	1,114.94	-314.30	1,160.15	972.12
Supplies & Materials	14,881.50	12,166.23	14,072.54	7,874.41	12,248.67
TOTALS	$105,591.36	$118,876.99	$125,435.71	$ 82,490.35	$108.098.60

Minicourses 2 and 8 were field tested initially as a single course. Therefore, on Table 1 the costs of the first preliminary field test of these courses were divided equally between the courses. However, in breaking this course into budgetary categories, preliminary field test expenses on the two courses were not equated.