

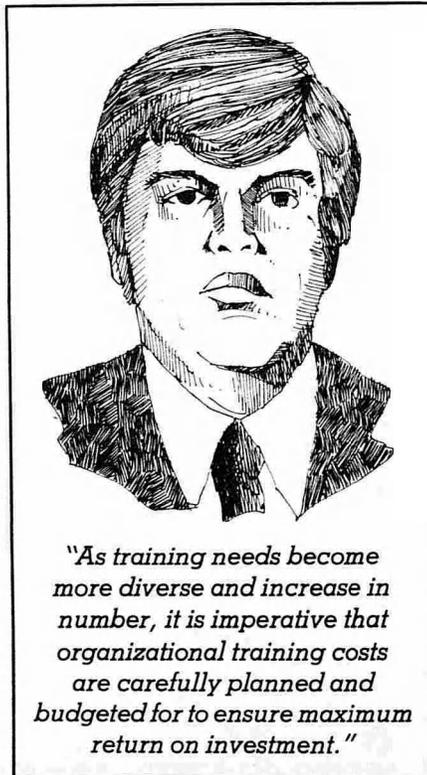
HERE'S A MODEL DESIGNED TO ENABLE YOU TO PREDICT
THE COST OF A PROPOSED TRAINING COURSE. . . .

FORECASTING FUTURE TRAINING COSTS

BY THOMAS
E. MIRABAL

In this era of massive technological change and ever-changing human resource requirements, one of the most pressing needs organizations are faced with is a sound employee training and development program. As training needs become more diverse and increase in number, it is imperative that organizational training costs are carefully planned and budgeted for to ensure maximum return on investment.

In the U.S. Civil Service Commission we have a systematic method for identifying training costs called the *Training Cost Model*. This system has been utilized in a number of federal, state, and local government agencies in the past several years since its inception in 1972. Additionally, as a result of my presentations to such groups as the Houston Chapter of ASTD, Manitoba Canada Society of Training and Development, the 1976 ASTD National Conference, and the TRAINING '77 Conference we have noticed a large degree of in-



"As training needs become more diverse and increase in number, it is imperative that organizational training costs are carefully planned and budgeted for to ensure maximum return on investment."

terest in this method in business and industry.

Essentially, the *Training Cost Model* is a simulation model. It simulates the behavior of training costs under various specified con-

ditions. This process is accomplished through a step-by-step procedure which enables the training manager to either predict the cost of a proposed training course or, in the absence of accurate cost data, to reconstruct the cost of a course previously conducted. In this instance, one can readily see that the *Training Cost Model* is the first part of a classic cost-benefit analysis.

Basis Information Workshop

There are four steps essential in utilizing the cost model. The first step requires one to make certain assumptions about the proposed training course. This process requires a knowledgeable trainer or someone who has a feel for the course objectives, potential course length, number of sessions needed, optimum number of participants, salary range of participants, course methodology, and geographic location of the proposed course. It is assumed in this process that a comprehensive front-end analysis has been completed and that training is in fact the behavior modification remedy best suited for satisfying

(Continued on page 87)

BASIC INFORMATION WORKSHEET

COURSE TITLE:

CURRICULUM HOURS/SESSION:

DATE:

SESSIONS/YEAR:

COST CATEGORY SPECIFIC ITEM	DIRECTIONS	
A. TRAINEE COSTS ORGANIZATION TRAINEES		
1. Number of Trainees 2. Salary • No. of trainees (level/step) • No. of trainees (level/step) 3. Or: Average level/step 4. Travel (a) Actual Costs (b) If Estimated Costs • Total no. traveling • By air • one-way distance direct (no. of trainees) • one-way distance indirect (no. of trainees) • By car • total distance (no. of trainees) • By other means • type • one-way distance (no. of trainees) 5. Days Per Diem for each trainee 6. Per Diem Rate 7. Materials and Supplies • Item • Total Cost • Item • Total Cost • • • • • • 8. Tuition for each trainee	1. Use total for the year 2. If step is unknown, use step 1 for orientation type courses, step 4 for all others. 3. Use this if specific level unknown. 4. (a) Use if actual costs known. (b) Use if actual costs unknown. Distance is in miles traveled by each trainee. "Direct" distance involves no change of planes. 5. If no. of days vary among trainees, group entries according to no. of days with corresponding no. of trainees. 7. Record annual cost for each category.	1. 2. 3. 4. 5. 6. 7. 8.
TRAINEE COSTS NON-ORGANIZATION TRAINEES		
9. (no. of trainees) 10. (no. of trainees) 11. (no. of trainees)		9. 10. 11.
B. INSTRUCTOR COSTS ORGANIZATION INSTRUCTORS		
1. Total curriculum hours per year 2. Average no. of instructors per session 3. Total in-class instructor hours per year 4. Total hours instructor preparation 5. Total instructor hours 6. Salary • No. of instructors • hours preparation and instruction per year • No. of instructors • hours preparation and instruction per year • • • • •	1. Multiply curriculum hours per session by no. of sessions per year. 2. Derived from estimation of total spent in a session by instructors. 3. Multiply #1 and #2, above. 4. If no data, use 2.5 hours preparation for each curriculum hour. 5. In-class and preparation time; add #3 and #4, above. 6. Use total hours spent under each grade category. Sum should equal entry in #5, above.	1. 2. 3. 4. 5. 6.

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COST CATEGORY SPECIFIC ITEM	DIRECTIONS	BASIC DATA
<p>D. DEVELOPMENT COSTS</p> <p>1. Salary</p> <ul style="list-style-type: none"> • Number (level/step) • Total hours spent on project • Number (level/step) • Total hours spent on project • • • <p>2. Contract Fees (total)</p> <p>3. Production Costs (total)</p> <ul style="list-style-type: none"> • Film • Tape • Slides • Other (specify) <p>4. Travel</p> <ul style="list-style-type: none"> • Actual Costs • If Estimated Costs <ul style="list-style-type: none"> • By air <ul style="list-style-type: none"> • one-way distance-direct (no. of people) • one-way distance-indirect (no. of people) • By car <ul style="list-style-type: none"> • total distance (no. of people) • By other means <ul style="list-style-type: none"> • type • one-way distance (no. of people) <p>5. Day Per Diem (total)</p> <p>6. Per Diem Rate</p> <p>7. Amortization Period</p>	<p>1. Use total hours spent at each grade level.</p> <p>3. If only total cost of a category is known, record here. If not, use Chart IVa to derive totals.</p>	<p>1.</p> <p>2.</p> <p>3. • Film • Tape • Slides • Other</p> <p>4.</p> <p>5.</p> <p>6.</p> <p>7.</p>
<p>E. MISCELLANEOUS COSTS</p>		

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Figure 2
Course Development Cost
Worksheet

FORECASTING FUTURE TRAINING COSTS

DATE: _____										
CHART I. TRAINEE COSTS										
COURSE TITLE	TRAINEES AND HOURS				SALARY		TRAVEL AND PER DIEM	MATERIALS AND SUPPLIES	TOTAL TRAINEE COSTS	
	No. of Trainees	Level and Step	Curriculum Hours	Trainee Hours	Hourly Salary plus Benefits	Total Salary	Annual Travel and Per Diem	Annual Cost	Total Trainee Cost	Trainee Cost per Trainee Hour
	1	2	3	4	5	6	7	8	9	10
DIRECTIONS FOR COMPLETING THE COLUMNS:	Enter total number of trainees per year for each grade. Total column for course.	Enter level and step of trainees. Treat different grades and steps as separate entries.	Enter length of course in curriculum hours.	Multiply each entry in column 1 by entry in column 3 and enter products here. Total column for course.	Using the salary table, enter salary rates plus benefits for each level. Use either the 8.6% or 25% table depending on organization policy.	Multiply entries in column 5 by corresponding entries in column 4 and enter products here. Total column for course. GO TO CHART 1a.	Enter figure from Chart 1a, col. 10.	Enter annual cost of expendable materials and supplies (e.g., workbooks, handouts) from Basic Information Worksheet. Total column for course.	Add corresponding totals in columns 6, 7, and 8 and enter sum here.	Divide entry in column 9 by column total in column 4 and enter result here. GO TO CHART II

CHART IA. TRAINEE TRAVEL AND PER DIEM COSTS										
COURSE TITLE	TRAVEL					PER DIEM				TOTAL TRAVEL AND PER DIEM COST
	No. Trainees Traveling	One Way Direct Distance Average	One Way Indirect Distance Average	Average Cost of Round Trip	Annual Travel Cost	Per Diem Rate	Number of Days Reimbursable per Trainee	Reimbursement	Annual Per Diem Paid	Total Annual Travel and Per Diem Cost
	1	2	3	4	5	6	7	8	9	10
DIRECTIONS FOR COMPLETING THE COLUMNS:	Enter number of trainees traveling to course each year. Group by distance. Total column for course.	Enter one-way direct distances in miles.	Enter one-way indirect distances in miles.	Determine cost of round trip. Use travel cost tables for air or rail. Compute cost for P.O.V. Enter figure here. Remember the \$6.00 ground fee.	Multiply entries in col. 1 by corresponding entries in col. 4 and enter product here. Total column for course.	Enter daily cost of per diem here. If per diem varies, average may be used.	Determine number of days reimbursable by per diem and enter here.	Multiply entry in column 6 by entry in column 7 and enter product here.	Multiply entry in column 8 by column total in column 1 and enter product here.	Add column total in column 5 to column total in column 9 and enter sum here. Also enter column total in Chart I, column 7.

**Figure 3
Participant Cost Worksheet**

CHART II. INSTRUCTOR COSTS														
COURSE TITLE	AGENCY INSTRUCTORS							NON-ORGANIZATION INSTRUCTORS			TRAVEL AND PER DIEM		TOTAL INSTRUCTOR COSTS	
	No. Instructors and level	Salary per Hour	Overhead per Hour	Salary Plus Overhead	Hours per Year	Annual Salary Plus Overhead Cost	Annual Salary Plus Overhead Cost per Trainee Hour	No. Instructors	Annual Salary or Fee	Annual Salary per Trainee Hour	Annual Travel and Per Diem	Annual Travel and Per Diem per Trainee Hour	Total Annual Instructor Costs	Annual Instructor Costs per Trainee Hour
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
DIRECTIONS FOR COMPLETING THE COLUMNS:	Enter no. of instructors and levels and steps. (Group identical levels.)	From appropriate table, enter salary (plus benefits) for each level of instructor.	From overhead table, enter overhead for each level of instructor. (O/h = 100% of base salary.)	Add corresponding entries in columns 2 and 3. Enter sum here.	Enter no. of hours spent only on actual instruction or preparing for instruction.	Multiply entries in column 4 by corresponding entries in column 5. Enter product, then total column for course.	Divide column total in col. 6 by column total in Chart I, col. 4, and enter result here.	Enter No. of paid non-organization instructors here. Group according to fee. Total column.	Enter fee for each instructor listed in col. 8.	Divide entry in col. 9 by col. total in Chart I, col. 4. Enter result here. GO TO CHART IIa.	Enter figure from Chart IIa, col. 12.	Enter figure from Chart IIa, col. 13.	Add column totals in cols. 6 and 9 and 11. Enter sum here.	Add column totals in cols. 7, 10, and 12. Enter sum here. GO TO CHART III

CHART IIA. INSTRUCTOR TRAVEL AND PER DIEM COSTS														
COURSE TITLE	TRAVEL						PER DIEM					TOTAL TRAVEL AND PER DIEM COST		
	No. of Instructors Traveling	Direct One Way Distance	Indirect One Way Distance	Cost of Round Trip	Annual Travel Cost	Annual Travel Cost per Trainee Hour	Per Diem Rate	No. of Days Reimbursable	Reimbursement	Total Annual Per Diem Paid	Annual Per Diem Cost per Trainee Hour	Total Annual Travel and Per Diem Cost	Annual Travel and Per Diem Cost per Trainee Hour	
	1	2	3	4	5	6	7	8	9	10	11	12	13	
DIRECTIONS FOR COMPLETING COLUMNS:	Enter no. of instructors traveling to course each year. Separate according to organization or non-organization instructors. Total column for course.	Enter one-way direct distance for each instructor.	Enter one-way indirect distance for each instructor.	Determine cost of round trip. Use travel cost tables for air or rail. Compute cost for P.O.V. Enter figure here. Remember the \$6.00 ground fee.	Multiply each entry in col. 1 by corresponding entry in col. 4 and enter product here. Total column for course.	Divide each entry in col. 5 by column total in Chart I, col. 4, and enter result here. Total column for course.	Enter daily cost of per diem here. If per diem varies, average may be used.	Determine no. of days reimbursable for each instructor in col. 1 and enter here.	Multiply entries in col. 8 by the per diem cost in col. 7 and enter product here.	Multiply entries in col. 9 by column total in col. 1 and enter product here.	Divide column total in col. 10 by column total in Chart I, col. 4, and enter results here.	Add entries in column 5 to corresponding entries in col. 10 and enter sum. Total column. Also enter in Chart II, col. 11.	Add entry in column 6 to corresponding entry in column 11 and enter sum. Total column. Enter also in Chart II, col. 12.	

F O R E C A S T I N G F U T U R E T R A I N I N G C O S T S

**Figure 4
Instructor Cost Worksheet**

CHART III. FACILITIES COSTS												
COURSE TITLE	NON-ORGANIZATION* OWNED SPACE				IMPROVEMENT TO SPACE		EQUIPMENT AND FURNISHINGS			TOTAL FACILITIES COSTS		
	Annual Cost of Required Space	% of Time Used for Course	Annual Cost of Space for Course	Cost per Trainee Hour	Cost per Year	Annual Cost per Trainee Hour	Total Cost of Items	Annual Cost of Items for Course	Annual Cost of Items per Trainee Hour	Total Annual Facilities Cost	Annual Facilities Cost per Trainee Hour	
	1	2	3	4	5	6	7	8	9	10	11	
DIRECTIONS FOR COMPLETING COLUMNS:	Determine size of facility in square feet. Multiply total square feet by annual rate; (or enter from basic information worksheet) and enter result here.				Multiply number of sessions by curriculum hours in each session; divide by 2,000 (Roughly the # of teaching hrs. available per year) and enter result here.		Multiply result of column 1 by column 2. Enter result here.		Divide entry in col. 3 by column total in Chart I, col. 4, and enter here.		Enter annual space improvements cost from basic information worksheet.	
	Divide entry in col. 5 by column total in Chart I, col. 4, and enter results here.				Enter total cost of equipment and furnishings from basic information worksheet. Group according to those items which will be amortized and those which will not. If item is to be amortized, divide entry in col. 7 by period of amortization and enter result here. If not to be amortized, carry cost intact from col. 7 to this column. Total column for course.		Divide col. total in col. 8 by col. total in Chart I, col. 4, and enter result here.		Add corresponding entries in cols. 3 and 5 to col. total in col. 8 and enter sum here.		Add corresponding entries in col. 4, 6, and 9 and enter sum here. GO TO CHART IV	

*N.B.: If interested in costing out Organization-owned space, use the same procedure as detailed in col. 1-4 but use \$1.86 for the cost per square foot.

**Figure 5
Facilities Cost Worksheet**

CHART IV. DEVELOPMENT COSTS												
COURSE TITLE	HOURS AND SALARY						CONTRACT FEES	PRODUCTION	TRAVEL AND PER DIEM	TOTAL DEVELOPMENT COSTS		
	No. Staff and level	Salary per Hour	Overhead per Hour	Salary Plus Overhead	No. of Hours Spent on Dev. Project	Salary and Overhead Costs				Subtotal of Dev. Costs to be Amortized	Total Annual Dev. Costs	Annual Dev. Costs per Trainee Hour
	1	2	3	4	5	6	7	8	9	10	11	12
DIRECTIONS FOR COMPLETING COLUMNS:	Enter number of staff personnel at each level and step. Show personnel total at bottom of column.						From salary table, enter hourly salary (incl. benefits) for each entry in column 1.			From overhead table, enter hourly overhead for each entry in column 1.		
	Add corresponding entries in column 2 and 3. Enter sums here.			Enter number of hours spent on course development for each entry in column 1. Total column for course.			Multiply each entry in column 4 by corresponding entries in column 5. Enter products and total column.			Enter portion of any contract fee for course development here. GO TO CHART IVa.		
	Enter total cost of production (films, slides, texts, etc.) from Production Chart IVa. GO TO CHART IVb.			Enter travel and per diem costs. To calculate use Chart IVb.			Add column total of column 6 to entry in cols. 7, 8, and 9 and enter here.			Divide entry in column 10 by period of amortization and enter amortized cost here. This is your annual development cost to be carried to Chart V, box 4a.		
	Divide entry in column 11 by column total in Chart I, column 4, and enter results here and in Chart V, box 4b.											

CHART IVA. PRODUCTION COSTS

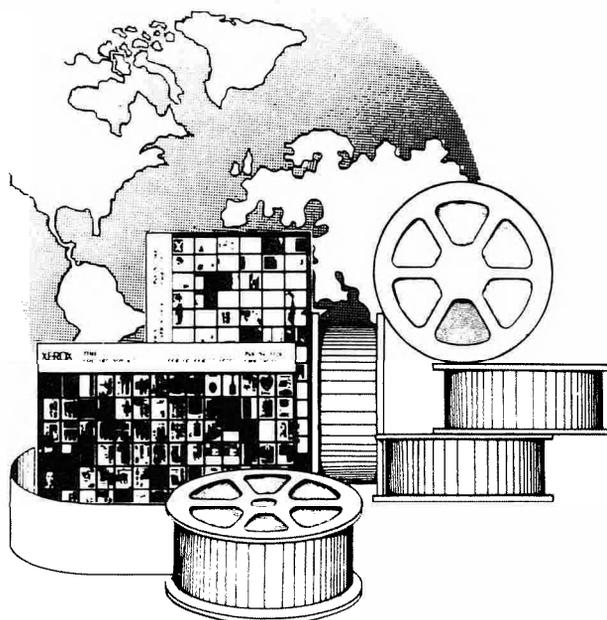
COURSE TITLE:

FILM	COST PER MINUTE	MINUTES PER REEL	NO. OF REELS	TOTAL
TAPES	FEET	COST PER FOOT	NO. OF TAPES	TOTAL
SLIDES	NO. OF SLIDES	COST PER SLIDE	NO. OF COPIES	TOTAL
OTHER				TOTAL
TOTAL PRODUCTION COST ENTER HERE AND ALSO ENTER IN CHART IV, COL. 8				

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CHART IVB. DEVELOPMENT TRAVEL AND PER DIEM COSTS

COURSE TITLE	TRAVEL					PER DIEM				TOTAL
	No. Traveling	Direct One-Way Distance	Indirect One Way Distance	Cost of Round Trip	Annual Travel Cost	Per Diem Rate	No. of Days Reim-bursable	Reim-bursement	Annual Per Diem Paid	Total Annual Travel and Per Diem Cost
	1	2	3	4	5	6	7	8	9	10
DIRECTIONS FOR COMPLETING COLUMNS:	Enter number of individuals whose development effort entails travel. Total column for course.	Enter one-way distance for each individual traveling directly.	Enter one-way distance for each individual traveling indirectly.	Determine cost of round trip. Use travel cost tables for air or rail. Compute cost for P.O.V. Enter figure here. Remember the \$6.00 ground fee.	Multiply each entry in column 1 by corresponding entry in column 4 and enter product here. Total column for course.	Enter daily cost of per diem here. If per diem varies, average may be used.	Determine number of days reimbursable for each individual in column 1 and enter here.	Multiply entries in column 7 by the per diem rate in column 6 and enter product here.	Multiply entries in column 8 by column total in column 1 and enter product here.	Add entries in column 5 to corresponding entries in column 9 and enter sums here. Total column. Enter column total in Chart IV, column 9.

**Figure 6
Total Course Costs**

COURSE TITLE:				DIRECTIONS:			
DATE:				A) Enter figure from Chart I, col. 9.			
1. TRAINEE COSTS				B) Enter figure from Chart I, col. 10.			
A. ANNUAL	B. PER TRAINEE HOUR			A) Enter figure from Chart II, col. 13.			
				B) Enter figure from Chart II, col. 14.			
2. INSTRUCTOR COSTS				A) Enter figure from Chart III, col. 10.			
A. ANNUAL	B. PER TRAINEE HOUR			B) Enter figure from Chart III, col. 11.			
				A) Enter figure from Chart IV, col. 11.			
3. FACILITIES COSTS				B) Enter figure from Chart IV, col. 12.			
A. ANNUAL	B. PER TRAINEE HOUR			A) Add "A" entries in boxes 1-4. Enter sum in box 5,A.			
				B) Add "B" entries in boxes 1-4. Enter sum in box 5,B.			
4. DEVELOPMENT COSTS				C) Divide entry in Box 5,A by column total in Chart I, col. 3. Enter result in 5,C.			
A. ANNUAL	B. PER TRAINEE HOUR			D) Divide entry in box 5,A by column total in Chart I, col. 1. Enter result in 5,D.			
5. TOTAL COURSE COST							
A. ANNUAL	B. TRAINEE HOUR	C. PER CUR. HOUR	D. PER TRAINEE				

(Continued from page 78)

the performance deficiency. This information about the training course is recorded on a form called the *Basis Information Workshop* (BIW) (Figure 1, pp. 79-81).

The next step in the process involves selecting cost data from standard cost-data tables for entry on four individual worksheets. There are four categories of standard cost-data tables: participant salary, travel to/from the training, course - development costs, and production-cost data. These standard cost-data tables can be derived individually for each organization. In its original development phase, the *Training Cost Model* standard data tables were developed to save time when the training manager had to make computations for entry onto the worksheets. An organization does not have to develop standard cost-data tables but rather can compute individual entries for actual costs such as preparation of overhead transparencies, cassette - duplication costs, etc., from suppliers or subcontractors.

The third step is the actual task of entering the data on four separate worksheets. These are:

- *Course Development Cost Worksheet* (Figure 2, p. 82)
- *Participant Cost Worksheet* (Figure 3, p. 83)
- *Instructor Cost Worksheet* (Figure 4, p. 84).
- *Facilities Cost Worksheet* (Figure 5, pp. 84-86)

The data entry is sequential and allows an opportunity for one to cross-check entries for accuracy. The *Course Development Cost Worksheet* contains these cost elements: salary and overhead cost for trainers involved in course-design activities associated with a particular course; contract fees for those portions of course development that may be contracted out; course - development production costs, e.g., printing handouts, making 35mm slides, etc.; and travel costs associated with course-development activities.

The *Participant Cost Worksheet* includes the cost of paying the salary, benefits, and travel costs associated with trainees attending a particular course. In addition this

worksheet captures the costs of expendable training materials and supplies used by trainees during a training session. Examples are workbooks, texts (if not reused), paper, pencils, etc.

The *Instructor Cost Worksheet* includes instructor salary and benefits allotted for class preparation and in-class instruction. It does not include course-development costs. Instructor costs for contract speakers is also captured on this worksheet. Any necessary travel costs for instructors or contract speakers in getting to and from the training location are also included on this worksheet.

The last worksheet is the *Facilities Cost Worksheet* wherein the cost of renting or leasing training space as well as the cost of equipment or furnishings are included. Equipment or furnishings might include such things as Bunsen burners for certain lab courses, telephone installation for remote computer terminal transmission, etc. This worksheet also includes an option to calculate organization-owned training-space costs.

Transferring Data

The final step in utilizing the training cost model involves transferring data from all four of the cost worksheets to a final summary worksheet which totals both annual and per trainee hour cost for participants, instructors, facilities, and course development. These are totaled for course cost that is accurate to plus or minus two per cent of the actual cost (Figure 6, p. 86)

If an organization does not have a need to calculate costs for participants, then he/she need only complete the worksheets that are of use to them. In this instance it is clear that each worksheet can be used alone or with all three other worksheets.

Tom Mirabal is the director, Training Consultation Services Office, U.S. Civil Service Commission, Dallas, Texas. In this capacity, he directs a staff of training consultants who are engaged in providing technical advice and assistance to federal, state, and local government agencies on all matters pertaining to training systems, methodology, and technology.

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