TRAINING IN BUSINESS AND INDUSTRY

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PREFACE

Managers of industrial and business organizations have in common the responsibility for directing and coordinating the activities of others. This, of course, is not their sole responsibility, but it is one that requires considerable time, skill, and patience. Part of this activity is the instruction of others in how to accomplish specific objectives or to perform certain tasks. This instruction ranges from relatively informal episodes to highly formal, carefully planned programs. In many industries and businesses, responsibility for planning, coordinating, and, frequently, for instructing, has become a staff function centered in a training department.

We hope that this book will have as its audience not only those persons who have staff responsibilities for training, but also those who manage training as part of their day-to-day line responsibilities. Those who manage such training have as much concern with industrial training as training directors because of the contribution of efficient training to the goals of an enterprise. So although we believe that this book will prove to be of assistance directly to training directors, we hope that it also will help them indirectly by stimulating managers to think about and help to

solve the current day-to-day problems of training in business and industry.

This book is not an attempt to present panaceas for problems in industrial training. In fact, there will be a minimum of "how to do it" information here. We will present a point of view concerning industrial training. One of our points is that there has been entirely too much written and spoken about how to carry on training and too little about the basic problems underlying training and basic approaches to their solution. We hope to present many of these problems and suggest approaches for solving them, but suggest few, if any, solutions. The present state of knowledge concerning training in industry justifies only the presentation of problems and suggested techniques for solutions.

In order to stimulate problem-solving in industrial training, we feel that we should make explicit certain of our assumptions concerning training. We assume, for example, that training, properly done, can contribute substantially to the achievement of the overall goals of an industrial organization. This may come through increased production and lower unit costs, higher quality, reduction of waste, or through indirect channels, such as improved morale and provision for adequate continuity of succession in management. On the other hand, we must admit that this assumption is as yet only partially tested. Too little systematic research has been done in industrial training to test fully this assumption. Neither can we develop a set of principles for training that are not open to easy assault. The few things that are known about industrial training we hope to present, and at the same time point to those "facts" and "principles" which rest on questionable grounds. We are, indeed, trying to present our particular viewpoint of training. Our point of view can be summarized by two basic statements:

1. Training is a management tool, not an entity or a field in itself.
2. Much must be done in implementing training before it can become a well-established, valuable management tool.

Training has been taken on faith (as has much of general education), and little or no demands have been made to evaluate

it in a rigorous fashion. Until training is submitted to systematic and carefully controlled research and evaluation, management will continue to use (or discard) a tool of unknown worth or, worse yet, jump from bandwagon to bandwagon as training fads skip from the case method, to role playing, to brainstorming, and back again. These techniques *may* have merit. We do not know, and the research which will tell us remains to be done. The evidence submitted thus far raises more questions than it answers.

We are not presenting an exhaustive review of the literature in the field of industrial training. We have ignored particularly the "cookbook" literature. With only one major exception, we have drawn our materials primarily from studies of industrial and military training problems. In discussing learning as a basic training process, however, we have dipped into the numerous laboratory studies conducted in this area. In writing, we may have confused our ideas with the points of view and statements of others; we have tried, however, to acknowledge by footnotes and bibliographical references our indebtedness to others.

Basically, this book expresses our viewpoint, which emphasizes the role of training as a tool of management along with selection techniques, engineering, cost accounting, time study, and the numerous other techniques which management has found necessary to use in order to achieve organizational goals. We have insisted that full utilization of training requires thorough-going research and evaluation, if sound principles for its use are to evolve. If we can stimulate one more member of management to demand rigorous research in industrial training, we will have accomplished at least one purpose of this book.

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June, 1961

ACKNOWLEDGMENT

It is extremely difficult for anyone to indicate fully his indebtedness to others when he writes a book. A chance conversation with a stranger, a remark by someone unidentified during a conference, or simply the cumulative experience of association with many individuals in his field may shape and mold what he has to say in a significant way. We first, therefore, acknowledge our indebtedness to the numerous unknown people who unknowingly helped fashion this book. Of those known to us, we particularly thank Dr. S. Rains Wallace who read the entire manuscript and made many valuable suggestions. We have incorporated the majority of them. Perhaps it would have been a better book if we had incorporated all of his suggestions but then the book would probably have never been written. Mr. Raleigh Biggerstaff corrected many of the grammatical faults in the manuscript. We appreciate this and absolve him from any responsibility for inherent faults in style which are entirely the work of the authors. Our appreciation of authors and publishers who have given us permission to quote from their publications is expressed here and is acknowledged in the citations throughout the book.

W. McG.
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1 TRAINING IN BUSINESS AND INDUSTRY TODAY

THE ROLE OF TRAINING

In the United States there are more than 65 million people in the work force. These people operate machines, package goods, write letters, tell other people what to do, buy and sell raw materials, and perform innumerable other acts involved in producing goods and providing services for a population of 180 millions. Not one of these individuals was born possessing the skills, knowledge, and attitudes required to perform the acts which produce these goods and services.

Annually, a million and a half newcomers join the ranks of this work force. These newcomers have been to public schools; many of them have completed courses at colleges and universities; others have received varying amounts of technical and professional training. From this group the individual who can perform effectively even the simplest task in business or industry without further training is the exception rather than the rule.

Complete and adequate statistics on the number of individuals

who change from one job to another in American industry and business in any year are not available. Certainly, the number runs into the millions. The individual who changes jobs, as a rule, must learn something if he is to perform his job efficiently even if it is just how to get along with his new boss.

No data are available as to the number of employees who must each year acquire new ways of performing their tasks because of changes in job content. With the constant introduction of labor-saving devices, trends toward automation, changes in practices in financing, buying, selling, and administrative procedures, job content can be assumed to show considerable variation from year to year. Each change in job content requires the worker to modify in some way what he does, if he is to perform his job in a satisfactory way.

The skills, the knowledge, and the attitudes required to perform the acts of working must be learned by each individual in the work force; certainly, many employees have acquired these through experience in industry. Yet others have learned outside the factory, or office, ways of responding to job demands on which improved skills and additional knowledge can be built. It is fairly well accepted, however, that the skill required to run a bulldozer, or the knowledge necessary to buy raw materials for processing into sheets, blankets, or bedspreads, must be acquired in some way.

We have used repeatedly the term "learning" in the preceding paragraphs. Much will be said about this concept in subsequent chapters. It is sufficient to indicate here that we are referring to the process or processes which take place when an individual acquires a skill, knowledge, or an attitude. Industrial training, therefore, refers to the efforts made to facilitate the processes we call learning and which result in on-the-job behavior required of a member or members of an industrial organization.

Training Defined

Training, at one time, had the restricted meaning of "education in a narrow sense" or "to drill." In modern industry, the term has become much broader than merely indicating efforts to develop sensory-motor proficiency. It now encompasses activities

ranging from the acquisition of a simple motor skill up to the development of a complex technical knowledge, inculcation of elaborate administrative skills, and the development of attitudes toward intricate and controversial social issues. In spite of the fact that in some quarters the term "training" still has the emotional connotation of the earlier, narrow meaning, we have been able to find no adequate substitute. It will be used, therefore, in the broader sense.

As previously indicated, those activities which are designed to develop or modify the behavior of employees are a part of training. We do not imply, however, that what employees do on their jobs is a result solely of company sponsored training programs. Actually, the behavior of an employee can be, and frequently is, modified by experiences which are not in any sense the results of a training program. He reacts to his superiors, his peers, his subordinates, his psychological environment of tools, equipment, materials, and machinery whether or not a formal effort is made to channel these reactions along specific paths. An employee learns much without and, sometimes, in spite of, a formal training program. In fact, learning of this sort may result in behavorial changes which negate efforts at training. We propose to limit discussion of training to those formal programs and procedures which an organization uses to bring about the development or modification of appropriate job-related skills, knowledge, and attitudes.

Training in industry has a specific purpose. It should provide experiences which develop or modify the behavior of employees in such a way that what the employee does at work is effective in the attainment of the goals and objectives of the organization. Although square dancing and other plant-directed recreational activities may some day be shown to have an effect on the productive ability of employees, we prefer to exclude such activities from our definition of training until a more concrete link between them and on-the-job behavior can be demonstrated.

Training in industry, therefore, is the formal procedures which a company uses to facilitate employees' learning so that their resultant behavior contributes to the attainment of the company's goals and objectives.

TRAINING—A MANAGEMENT TOOL

Proper utilization of training in modern industry and business requires that it be put in its proper context. It is not an end in itself, but a means to an end. The function of an industrial organization is to produce goods and services which have social utility, not to train members of society. Furthermore, the goods or services produced must be competitively priced, yet at a level that allows the enterprise to derive a profit so that it can continue its existence.

The complexity of modern business and industry has given rise to utilization of many tools which are not directly related to the production of goods and services at a profit. Among these are cost accounting procedures, engineering services, research activities, and numerous others. Although each of these tools is utilized as means to the achievement of the goals of the enterprise, none of them produces directly any product or service for the ultimate consumer.

One such set of tools widely used by management is comprised of a group of activities concerned with the effective utilization of the human resources of an enterprise. These personnel procedures constitute an effort to fulfill in a systematic fashion the functions which formerly were served by a face-to-face interaction between employer-owner and employee. They include such activities as the selection and training of employees, establishing and maintaining rates of pay, and building employee loyalty and *esprit de corps*. The growth of these personnel procedures as a special function in modern business and industry is indicated by studies conducted by the National Industrial Conference Board (Seybold, 1954) and by the annual studies of Yoder (1957).

We must point out here that personnel procedures differ in one important respect from such management tools as cost accounting, engineering services, and research. The individuals in an industrial enterprise who directly supervise production do not have to be cost accountants or perform engineering services. These activities can be left to specialists. This is not true of personnel procedures. The manager, whether he is a first line fore-

man or the chairman of the board, must perform personnel functions even though a group of personnel specialists are available to assist him. The responsibility for personnel is an integral part of a line assignment and cannot be delegated. The implications of this for line personnel and training specialists will be brought out subsequently.

The Interaction of Personnel Procedures

The effectiveness of training in an organization is related closely to a number of factors, and particularly to the effectiveness of other personnel procedures. This is especially true of its relationship to the effectiveness of the employee selection and placement procedures utilized by the organization. Individual differences in aptitudes and temperament and their relationship to learning specific skills and acquiring specific knowledge will be discussed in a later chapter. Figure 1.1, however, illustrates the differences in speed of learning of power sewing machine operators all trained by the same method. A careful selection of

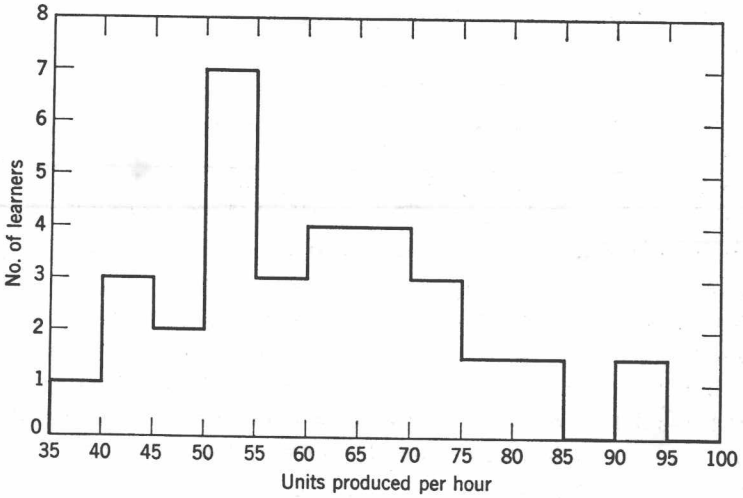

FIGURE 1.1 Individual differences in learning on power sewing machines. Median production during 13 weeks of training for 30 learners. Range 38–92 (unpublished data).

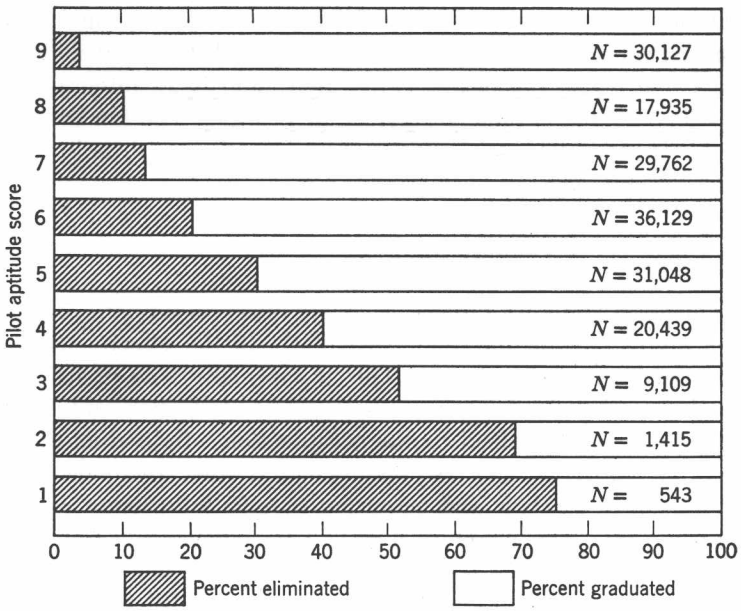

FIGURE 1.2 Elimination of cadets from elementary flight training in relation to pilot aptitude score (after Philip DuBois).

learners here would have eliminated the "slow learners" before training and brought much greater returns to training efforts.

There is some evidence, although not conclusive, that poor selection of personnel can increase training costs and reduce its effectiveness. Figure 1.2 shows the percentage of aviation cadets eliminated from flight training in the American Air Force at each level of a pilot aptitude score (DuBois, 1947). It is obvious from the data in this figure that not only money but also time would have been saved if only those cadets scoring in the upper half of the pilot aptitude test had received training. The impact of these data becomes even greater when one recalls that the demand for pilots, instructors, and training equipment was great and all were in short supply.

A further example from industry also points to the relationship between selection of trainees and the outcome of training efforts (Figure 1.3). Cook (1947) estimates the cost to the company

employing and training the girls who did not pass the dexterity test as approximately $10,000. From the standpoint of training, it is apparent that inadequate selection of these trainees reduced the effectiveness of the training procedures and their possible contribution to company goals. It is entirely possible that the failure of well-planned training programs in industry may be attributed, at least in part, to poor selection and placement of personnel.

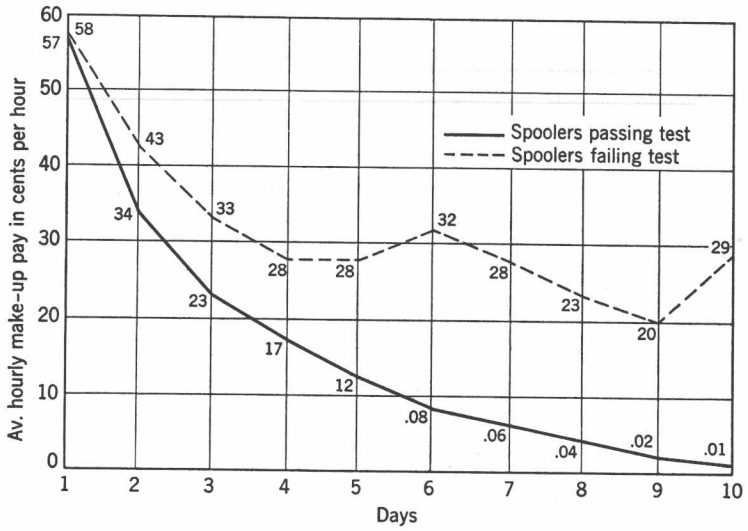

FIGURE 1.3 Difference in average hourly make-up pay in cents per hour between spoolers passing and spoolers failing finger dexterity test (after D. Cook).

The effectiveness of any training program is related to other personnel procedures and conditions existing in the organization. In the insurance industry, for example, training of new agents is frequently done in the many agencies. The quality and amount of training varies widely from agency to agency. This suggests that agents with the same potential for success do not receive equivalent training. It is quite possible, therefore, that the tests and other techniques used for selection are less capable of predicting success, because potentially able men do not receive the requisite training. Standardization of training programs might make it possible to improve the effectiveness of selection pro-

cedures. On the other hand, conditions in the organization can have marked effects on a training program. Social pressures from experienced employees can affect the rate of performance of new employees. The general managerial climate of a company can materially affect the outcomes of a supervisory training program (Fleishman, 1951).

The Achievement of Organizational Goals Through Training

Training is one of the personnel procedures used by management for achieving the organizational goals of the company. It may be directed toward achievement of subgoals, such as waste reduction, improvement of quality, or reduction of accidents. Ultimately, however, it is a tool to be used to assist in the production of goods and services of social utility at a competitive price, which results in a profit for the organization. It does not operate in isolation from other personnel procedures, both depending on them for its effectiveness and in turn contributing to their effectiveness. These procedures, furthermore, may enable management to use more effectively the numerous management tools which seem indispensable in the efficient operation of a modern business or industry.

THE STAKE OF BUSINESS AND INDUSTRY IN TRAINING

As we have seen, training is a tool of management, but to what extent, where, and how can management utilize training in achieving organizational goals?

As indicated earlier, each new employee must learn something, if only the location of the washroom. The problem of getting each new employee to the point where his efforts contribute to the company goal of profitable operations is an imperative one. As long as John Doe is receiving $1.85 per hour for productive activity and is producing less than this for his organization, he is a liability. He does not start becoming an asset until he regularly produces goods and services which can be sold for considerably more than he is paid. There are many costs of maintaining John other than his salary: costs of fringe benefits, differences in

overhead costs between keeping John as opposed to a more productive employee, the impact of John Doe on the productivity of other employees, the waste produced by John in the course of his work, as well as many others.

The cost of John Doe's failure to meet the requirement of producing goods or services which can be sold in excess of the amount of money paid him frequently is masked. This is especially true if only one or two substandard producers are in a given department or section of a business. However, the cost of substandard production can become quite dramatic when a large number of novices are brought into an operation at the same time. One organization had to expand its work force approximately one-third in a very short period of time. During this period, the differential between actual earnings and minimum wage increased 165%, and defective goods increased 110% over the period prior to expansion of the work force. The excess cost of producing the commodity was attributable almost entirely to the lack of skill and knowledge of the new employees who were being trained.

Training Cost and Profitability

It is quite clear, therefore, that substandard production can result in expensive costs. Training is designed, at a minimum, to raise productivity to the point where all costs of the end product are low enough to permit a profit. One cost is that of training. One objective of any training program is to increase productivity to the point where the end product costs less with training than it does without. Simply put, one should not focus on the fact that a given training program costs $10,000 in personnel, equipment, and overhead. One must determine whether the benefits exceed $10,000. Whether or not a given training program is profitable cannot be determined in terms of the cost of the end product unless a comparison can be made of end-product costs with and without training.

Estimates are usually made as to the actual dollar costs of training employees for various jobs without regard to profitability. These estimates are of the costs of training using methods and procedures current in American business and industry regardless of the efficiency of these training methods. Actually, no estimates