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education and training — some problems and trends in an industrial society

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In view of the fact that school leavers and university graduates have had a general education rather than one specific to the manpower requirements of industry, a significant amount of job-orientated training must be undertaken by industry. Much of the skill and knowledge acquired both at school and university is generally applicable to industry but the new employee cannot undertake independent work without further training. The vast majority of school leavers and university graduates cannot undertake tasks in industry without further education and training and the effort required to convert these people into productive units is an increasingly expensive and time-consuming procedure.

The gap between the school and industry

With the increasing rate of technological change it is questionable whether South Africa can afford twelve years of schooling and possibly a further period at a university and then retrain (or provide further education and training) to meet production requirements. There must be closer liaison and co-operation between the training efforts of industry and those of the educational system. It is not suggested that educational values become subordinate to the objectives of industry but that a closer working relationship will allow the educational system to prepare people more adequately for training in industry.

Attitudes towards industry in the schools

The educational system could assist by creating attitudes which are functional to the advancement of an industrial society. For example, many schools regard the apprenticeship as a haven for those who cannot cope at school. There is a kind of intellectual snobbishness which disdains the more practical spheres of human activity. There is a lack of understanding about what goes on within the walls of factories. Many pupils are directed to technical high schools and apprenticeships because they cannot cope in other high schools. The attitudes and values of teachers tend to favour academic and **white collar** occupations largely because teachers have had little or no contact with the industrial environment. Schools seem to engender an attitude that is not sympathetic to industry in respect of technical careers in the workshops or factories.

What does the average teacher know about industry?

It is unfortunate that most teachers do not gain first-hand experience of the world for which they are preparing the majority of their pupils; that is: the world of commerce and industry. Most teachers follow a cycle that begins with school, continues with college and/or university and returns to school. Experience in the outside world might give teachers more perspective about the need to transmit the knowledge and skills that help people to cope with the problems in industry.

The work of SEIFSA

The Education and Training Division of the **Steel Engineering Industries Federation of South Africa** (SEIFSA) has designed in collaboration with industry a syllabus entitled **Industrial Orientation** for inclusion in courses presented at technical colleges, to show that the expectation of the company can be reconciled with the needs of young people. If a closer link is not established between formal education and industry, between the school and the working world schools will become almost meaningless to industry, for it is becoming increasingly apparent that the effective worker is not necessarily the man who performed well at school or the man who holds the largest number of degrees or the person who has attended the most post-graduate courses. Industry is beginning to recognise that aca-

demic achievement is not in itself a valid yardstick for measuring work potential. As educational programmes are more closely scrutinised the number of programmes which industry has supported so lavishly in the past may be terminated.

The school and university system must pay more attention to the educational infrastructure that should support a man before he can begin to acquire job-oriented skills. Professor J. Vaizey discussing the educational objectives for the 1980s states "I see a rapid increase in the total 'educational content' of the entrants to the labour force, and more give-and-take between the education system and the employment world, because of the interdependence of education and training, especially at the 16 plus level".

Peter Drucker and educational productivity

One hears a great deal about increasing productivity but very few critics relate it to teaching in industry and educational institutions. An increasing amount of money is devoted to education and training with very little concentration being placed on the effectiveness of the education and training system. Drucker (1969) stated "it is not that we cannot afford the high costs of education; we cannot afford its **low productivity.** We must get results from the tremendous investment we are making . . . teaching is where agriculture was in about 1870 when it took some twenty men on the farm to feed one non-farmer in the town. We have to make the teacher more productive, have to multiply his or her impact, have to increase a great deal the harvest from his or her skill, knowledge, dedication, and effort. Otherwise we shall run out of teachers — even if we do not run out of money for education".

The Educator in industry

The training officer has been forced to establish needs and priorities and to design programmes according to specified objectives. If this process involves the corrective training of aspects of poor performance, the trainer has the opportunity of developing the **total** person. Where employees have to be introduced to new skills, the trainer attempts to create situations directly related to the new skill through the use of simulated situations e.g. role plays, case studies, management games, in-basket exercise and simulated material. Unlike evaluation in the educational system industrial competency is measured in terms of job performance.

Freedom to innovate in industrial training

In view of their freedom from examination systems, training officers have been more innovative in devising new teaching techniques than teachers in the educational system.

How can we evaluate industrial training?

The **profit motive** in industry directs attention to the **economics of training**, which is closely watched by management. Training personnel claim that training is an investment. Management want to receive a return on this investment in terms of improved productivity. Not surprisingly there is a notable absence of published research on the economic returns of training. In recent years there has been a mushroom growth of training in many industries. Yet the evaluation of training has lagged behind largely because it is one of the most difficult aspects of training.

Objectives and evaluation

More and more emphasis will be placed on **evaluation,** because evaluation could demonstrate what contribution training provides to improve performance of employees. Without this link, training, even where there is validation of programmes, can be undertaken only in the hope that it will outwardly improve performance. Cost benefit analysis means not just the establishment of direct links between training and performance on the job, but the evalutation of the training investment in quantitative monetary terms similar to that used in the appraisal or evaluation of a physical capital investment.

An increasing percentage of the national budget is being devoted to the educational system and its productivity is at present largely taken for granted. It is not unreasonable to expect that it becomes more productive and more aware of the need to define objectives. Research findings in respect of 'transfer of training' have made it abundantly clear that the setting of objectives is important and that an educational programme that claims a general training of the mind is useful in specific skills is in all probability invalid.

"It is economic pressure more than anything else which has stirred public and, to some extent, governmental interest in education in recent years — the idea that education means money. Since the second world war this attitude has become more prominent and it has had the propagandist advantage that it has introduced a note of hard realism into a field which in the past has produced a fine crop of vague theorising." (Bantock 1969).

Operative training — recent developments

Until recently very little attention was paid to operative and management training. The 1970s will mark a new interest in the training of these two categories of manpower and there will be a realization that effective training in these areas must involve the entire company because of the inter-function of all employees.

Operative work is highly specific to the company and therefore training must be undertaken within the company. In most cases the new employee is placed side by side with an experienced worker and through watching the various phases of the operation becomes aware of what is required and through trial and error will master the operation, eventually being left to perform independently. This form of training is commonly known as 'sitting by Nellie'. It has served industry well in the past but the application of systematic analysis and planning of operator training linked with increased wages is forcing industry to attempt improved work performance of operators through the application of improved training methods.

In view of the specific nature of most operative training, industry is unable to farm out its training requirements to the educational system and is forced to largely undertake this task within the company.

The skills and knowledge required by managers are increasing and managers at all levels are becoming aware of their inadequacy in certain situations. Management development programmes are available but in many cases are beyond the reach of practising managers. They have the experience which should make management training meaningful to them but are not given the opportunity to attend the full-time courses and do not have the energy to pursue these tasks on a part-time basis.

Management training

In view of the difficulties of part-time study and the practical problems involved in releasing managers for long full-time courses, short courses are at a premium. In 1971 it was estimated that there was a R7,2 million turn over in seminar and executive training programmes provided by some thirty organisations. These short courses have a duration of anything between one and five days. Most of these short courses do not meet specific training requirements of companies and are presented to an audience with varying levels of knowledge and experience. Further, any new management techniques which the participants wish to introduce into their company may be thwarted by re-entry problems. The "climate of the company" may not be flexible enough to accommodate new ideas and the nature of the knowledge gained over a short period is not detailed enough for any constructive re-organisation when returning to the company and without further guidance to overcome problems. The new techniques are frequently, after a few weeks of company routine, left to wither.

Most organisers of short courses make very little attempt to evaluate the effectiveness of the course and do not go further than requesting participants to fill in a feedback sheet at the end of the session and the construction of the questions are such that they largely omit true evaluations of the objectives of the course. Short courses have proved to be largely ineffective in the training of managers.

If management training is to be effective the total company must be considered and an overall training policy introduced to meet the company's training needs. This can only be achieved through extensive in-company training programmes supported by consultants where specific areas of expertise are required and not available within the company. The training consultants should gradually work themselves out of a job by arranging a programme where the existing training department can fill a gap in its expertise and consolidate the position once the consultants have left the company. Short courses should only be utilised if the objectives have been clearly defined and if these meet the training requirements of the company. Com-

panies should also utilise external short courses where exposure to new ideas will lay a foundation for the development of these ideas within the company. This in many cases adds authority to the training of the company.

Short courses for small companies

Small companies cannot afford systematic in-company training, so short external courses will continue to be important to them. Nevertheless, unless the present short courses are considerably changed there will be a relative decline in the number presented but there will be an increase in the use of consultants providing specific services to industry to work on problems which the company training department cannot solve.

Companies are reluctant to introduce extensive in-company training programmes through the establishment of training departments because of the lack of skilled personnel to fill training posts, the lack of confidence in the economic viability of such a proposition and in particular the assumption that personnel trained at their expense will leave their employment.

The effective introduction of operative and management training on an in-company basis however depends on skilled training personnel. This creates an immediate problem in that there are very few skilled instructors and training and development officers available for this task.

SEIFSA's leadership

In 1972 the Steel and Engineering Industries Federation of South Africa (SEIFSA) in collaboration with the Colleges for Advanced Technical Education introduced a certificate course for industrial training instructors designed specifically for personnel involved in the training of operatives and apprentices. In 1973 the South African Institute for Personnel Management (SAIPM) introduced a diploma course for training and development officers. There is a shortage at present and as companies become more aware of the needs for skilled training personnel the more the shortage will become. The efforts of SEIFSA and the SAIPM and other organisations in providing short courses have little chance of meeting the requirements in this field under present conditions.

The position is further complicated by the fact that where in-company training is conducted off the job re-entry problems to the working environment are encountered. The responsibility for training cannot be left entirely to the training department. It must be shared by experienced workers on the job. This in effect means that training becomes part of the supervisors and experienced workers' job. Training must therefore be provided for them in instructional techniques in order to consolidate off the job training and also to provide independent on the job training.

Because of the reservations management have regarding the effectiveness of systematic training it is unlikely that companies will introduce extensive training departments without some external encouragement. In Britain this external encouragement has taken the form of levy grant procedures. A levy is placed on companies and those providing training can recoup this expenditure. In South Africa a similar system has been introduced notably by the metal and engineering industries who are largely utilising the educational system to promote apprentice, technician and supervisory management training and, at this point in time, are not concentrating or encouraging companies to establish in-company training departments. The number of in-company training departments will increase during the course of the 1970s if the levy grant system is extended to operative and management training.

The Future

In summary the problem areas and trends in industrial education and training will be an increased awareness of the need for combined effort by the educational system and industry to meet the manpower and human needs of an industrial society. With the rapid accumulation of new knowledge and skills the productivity of the educational system and industrial training will receive attention. Lastly there will be an increase in the development of training departments within companies and the growth of courses for instructor and training and development officers.