A Modern Apprenticeship Scheme in the United Arab Republic

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A modern apprenticeship scheme has been developed in Egypt during recent years, starting from a survey that was carried out between 1953 and 1954 by an expert appointed by the I.L.O.

The object of the scheme is to give young people training in the various industrial skills, and at the same time to provide them with sufficient theoretical knowledge, to enable them to become skilled workers in their trades. The period of training is also used to improve their general education insofar as this is compatible with the technical training, in accordance with the principle that industrial work requires not only technical skills and knowledge but also co-operation, team spirit and other moral qualities.

This article, which describes the scheme and discusses some of the problems involved, has been written for the benefit of persons who may be concerned with other new apprenticeship schemes in countries where conditions are similar to those in Egypt.

THE actual organisation and the principles and methods of implementing the new apprenticeship scheme introduced in Egypt a few years ago can obviously not be considered in detail until something has been said about the main features of the Egyptian employment market, as these had to be taken into account in the framing of the plan. They are—

(a) The boundaries of the different trades are not well defined. In many cases, and especially in small undertakings, there are men who are doing or who are willing to do work outside their own trades.

(b) Individual trades are not generally represented by separate labour organisations; there is no such thing as a "carpenters' union" or a "sheet-metal workers' union".

(c) The majority of skilled workers at present available have had no systematic training; they entered their trades through the old apprenticeship system 1 or started as helpers.

(d) The old apprenticeship system, with its many drawbacks, is still used in all the small and medium-sized undertakings and in most of the large ones.

(e) Only limited training facilities were available when the establishment of the new scheme was first thought of. Apart from the trade schools runs by the Government only a few of the large undertakings operated training centres of their own.

(f) The labour organisations do not yet understand the value of better training as a means of raising the social standard and value of workmen in the community.

OUTLINE OF THE SCHEME

The new scheme was designed to impart training in two stages.

The first of these is the basic training period, during which the new apprentice receives training at a centre, which is a kind of vocational school especially equipped for training purposes, where he follows a pre-set and well-thought-out course of instruction in the basic skills of the trade.

The second stage is the "on-the-job" period in which the apprentice who has completed the course at the centre is given further practical training under the supervision of a skilled worker and in a normal production environment at the employer's plant.

At the time that the new scheme was being drawn up all undertakings in the country, with the exception of two or three, were using the old form of apprenticeship exclusively.² It was thus impossible to place the training scheme entirely in the hands of industry, and it therefore became the responsibility of the Vocational Training Division of the Productivity and Vocational Training Department of the Ministry of Industry.

The Department has worked out standards and "work-process schedules"; it selects and registers apprentices, supervises training, keeps records, organises periodical tests and final examinations, issues apprenticeship certificates, and so forth. It has also undertaken the costly and often tedious task of setting up and operating

¹ Under the old apprenticeship system apprentices assisted skilled workers and, while doing so, gradually picked up the trade. Lack of planned programmes and absence of supervision are characteristics of this system.

² It is true that there has been some previous attempts to set up apprenticeship schemes in state undertakings; but these did not go far enough, and it is safe to say that most employers and workers knew little about apprenticeship schemes when the new system was introduced.

a fully equipped chain of training centres in which the basic courses of instruction are given.

From the first it was decided that industry should rely on its own resources as far as possible. The large industrial undertakings are therefore always urged to set up their own training centres, and the Productivity and Vocational Training Department offers to assist any undertaking that is willing to take part in the scheme in this way. The Department's aid includes help in determining the undertaking's future staff needs and the training facilities required, and it assists in preparing the programmes and in the selection of apprentices and supervision of training.

Naturally, not all undertakings are large enough to have training centres of their own. If medium and small undertakings, which form the majority of all concerns in Egypt, are to take part in the scheme, some way has to be found of providing the necessary training facilities. One solution of this problem is the governmental training centre serving a number of medium or small undertakings ; it is this system that has been adopted in Egypt.

In the first place certain basic principles concerning the duties of a training centre were agreed upon in the light of local conditions. A training centre, although basically a school, should as far as possible have the same atmosphere as a normal industrial plant so that apprentices can adjust themselves to a working environment from the outset. The centre would provide not only the workshop training necessary for the basic course but also the theoretical instruction required in both the basic and the on-the-job periods. In addition, apprentices would, during the on-the-job period, serve the last month of every year at the centre, where they would be tested on the progress made during that year. The centre would also conduct final examinations leading to the issue of apprenticeship certificates.

The conditions of admission were to be that the applicant should be between 14 and 18 years of age and that he should hold a " preparatory school certificate". Since this certificate is obtained after only nine years of general education the general knowledge of such persons obviously falls short of the standard required of a modern skilled worker, and additional general instruction must be given at the centre. A part of the classroom instruction is, therefore, devoted to such general cultural subjects as Arabic and other languages.

The State was to encourage employers to take part in the scheme by making the services of training centres available free of charge; as a further incentive apprentices were to be issued free with such items as notebooks, exercise books, drawing and instruction sheets, etc. They were also to be provided with workshop overalls and a free midday meal. The role of the Department is explained in the following articles of the Standard Apprenticeship Agreement :

Article 4. Both parties agree to request the guidance and assistance of the Productivity and Vocational Training Department. In particular they agree that at the beginning of the apprenticeship period the apprentice shall attend a basic training course of months at a training centre of the Productivity and Vocational Training Department and any other courses, tests and examinations that the Department may specify. Any period spent by the apprentice at the training centre for this purpose shall be considered as having been served at the employer's works.

Article 5. The progress made by the apprentice shall be checked periodically by means of tests organised by the Productivity and Vocational Training Department.

Article 6. At the end of the apprenticeship period a final examination, organised by the Productivity and Vocational Training Department, shall be held.

Article 8. The employer agrees in particular—

- (a) to give the apprentice the necessary training by means of appropriate work in his plant in accordance with the plans and programmes drawn up jointly with the Productivity and Vocational Training Department;
- (d) to send the apprentice to the relevant training courses, the tests and the examinations set up by the Productivity and Vocational Training Department;
- (e) to allow the apprentice time off for one day a week on which day the apprentice is required to attend a theoretical instruction course. This day will be considered as having been served at the employer's works;
- (f) to allow representatives of the Productivity and Vocational Training Department to visit the works and to inspect the training facilities;
- (h) to submit this Agreement to the Productivity and Vocational Training Department for registration.

Article 19. When the apprentice has served the required period and has successfully passed the final examination, he shall be given a written apprenticeship certificate issued jointly by the Productivity and Vocational Training Department and the employer. The certificate shall state the trade learnt, the duration of apprenticeship and the degree of skill and knowledge acquired.

The Department comprises six main sections, namely—

(1) the Information Section, which is responsible for propaganda and information activities and for the library and the publications issued by the Department;

(2) the Standards Section, which works out apprenticeship standards;

(3) the Training Centres Section, which controls the Department's centres;

(4) the Follow-up and Supervision Section, which recruits and registers apprentices, keeps records and follows up on-the-job training;

(5) the Psychological Testing Section, which organises psychological tests for new applicants; and

(6) the Technical Office, which directs the design and building of training centres and works out training programmes in accordance with the standards.

One of the first major problems was to draw up a standard form of apprenticeship agreement. Before training begins, an apprenticeship agreement is signed by the employer, the apprentice and a representative of the Department.

A draft form of agreement was worked out covering the respective duties and responsibilities of employers, apprentices, guardians, and the Government, entry conditions (age limits, standards of education, medical fitness, etc.), the duration of training, probation periods, apprenticeship allowances, holidays, accidents, etc.

Various points had to be taken into consideration when working out the detailed provisions of the model agreement. Firstly, the scheme had to be designed to cater for the country as a whole. Secondly, as a governmental body the Department had to be strictly impartial. Lastly, since the scheme was new and needed support, every effort had to be made to obtain a favourable reaction from employers and to convince them that it was for their benefit.

When the draft was ready it was decided that the first group of companies taking part in the scheme—which represented a fairly wide field of industrial activity, including sheet-metal fabrication, transport, general engineering, metal working and steel production —should be asked for their comments on it. Apart from the psychological effect of this step, it was important that the agreement should be acceptable to all concerned.

A number of points were raised by the representatives of the companies during special meetings at which the draft agreement was discussed.

A long discussion took place as to the status of the apprentice. Should he be considered as a worker or as a trainee? One important point raised by the companies was that the discharge of workmen who have been employed for more than six months was restricted by Egyptian legislation and that if the apprentice were to be treated as a worker the employer might find it difficult to discharge him at the end of his apprenticeship under the relevant provision of the draft agreement. The employers were therefore unwilling to pay apprentices wages and insisted that they be paid apprenticeship allowances only. This point of view was accepted and the term "wages" in the draft was replaced by "apprenticeship allowance". In addition, the following clause was added: "At the expiry of apprenticeship the employer may or may not enter into an employment contract with the apprentice."

Since the apprentice was to be considered as a trainee rather than a worker, certain stipulations had to be included in the agreement in order to safeguard his interests. The following are some of the articles added for this purpose :

Article 12. The apprenticeship allowance shall remain payable during statutory holidays.

Article 14. The apprentice shall be granted 15 days' annual leave, to be taken during the summer school holidays. The apprenticeship allowance shall be payable during this period.

Article 15. The apprentice shall be entitled to four weeks' sick leave per year, during which he shall receive the full apprenticeship allowance, and to another four weeks per year during which half the allowance only shall be payable. No allowances are payable in respect of sick leave beyond the eighth week.

Article 17. Compensation for any accident or illness incurred as a result of the apprentice's work shall be provided in accordance with the legislation in force at the time.

Article 20. The apprentice shall not be required to work for more than eight hours per day and shall be entitled to 24 consecutive hours off each week.

The following articles were inserted to safeguard the interests of the employer :

Article 9. The apprentice agrees in particular-

- (a) to observe and be subject to the rules at the employer's works and to obey the lawful orders of the employer or his representatives;
- (b) to conduct himself at all times in a satisfactory manner and at all times to carry out the tasks given to him in the best interests of his employer;
- (c) not to reveal the secrets of the employer's business and not to do or suffer to be done any damage or other injury to the property of the employer or his customers;
- (d) not to participate in any labour dispute that may occur at the employer's works.

Article 10. The guardian consents to be jointly liable with the apprentice for any loss or damage wilfully caused by the apprentice.

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Article 18. The employer shall be entitled to terminate the agreement in the following cases without becoming liable for payment of compensation: (a) if the apprentice absents himself from work without permission for

- ten days consecutively or 15 days intermittently in any one year;
- (b) if the apprentice misconducts himself to such an extent as to show himself unsuitable for the trade.

Some companies objected to the proposal to pay allowances to apprentices during the first year of training. They argued that, since the apprentices spent the first year of this training in a centre run by the Department, they were doing no useful work for their employers. It was explained that, although this was true, during the period that an apprentice spent at the centre he would receive basic training in the trade and acquire a considerable amount of skill and knowledge before joining the employer's plant. The employer would receive a properly trained, useful and productive worker ready to continue training on the job and would thus save the time normally spent in teaching a new apprentice the basic elements of his trade.

An apprenticeship allowance scale was finally agreed as follows:

Stage of apprenticeship	Amount (in piastres per day)	Percentage of average wage of skilled worker ¹
First year	7	14
Second year	15	30
Third year	25	50

¹ The daily wage of an average skilled worker was taken to be 50 piastres.

The allowance, expressed as a proportion of a skilled worker's wages, appears low as compared with the scale found in some other countries, but it should be borne in mind that in Egypt apprentices are normally only 15 years of age and are kept by their parents. In addition, as in the initial stages general support, and particularly that of the employers, was needed for the scheme, it was necessary to proceed in easy stages until all those concerned could be convinced of the benefits it offered.

The companies claimed that they should be entitled to retain the apprentice as a skilled worker after the end of training if they wished. They argued that they were paying for the training and should, therefore, have the right to a return on their investment. The Department strongly opposed this, because if the employer were given the right to retain the apprentice the principle of freedom of the individual would be infringed. It was further explained to the employers that, although they were paying the apprenticeship allowance, they were in fact recovering a good part of their investment in the form of useful work done for them by the apprentice. Besides, the Government was also paying for all training at the centre, for instruction in related subjects, and for a good part of the on-the-job training in the form of supervision and follow-up. All these facilities were provided as a free service from which the employers would be the first to benefit, and the argument that they were paying for the full training period was therefore unfounded.

Apprenticeship Standards

From the first it was found that the term "apprenticeable trade" was a source of confusion to many and a cause of dispute for some. It was therefore decided that a preliminary list of apprenticeable trades should be prepared covering nine industries, namely metal work, foundry work, woodwork, electrical and electronic engineering, glasswork, leather tanning, textiles, printing, and building. A list of 55 specific trades in which it was felt that training was needed was drawn up and definitions given. The list proved very useful and served as a satisfactory guide for all concerned.

Standards first had to be drawn up for four of the metal-working trades (fitter, fitter-machinist, machinist, and turner). It was found quite inadequate to indicate each trade simply by name because, as was mentioned earlier, the lines of demarcation between trades in Egypt are not clearly defined. Each set of standards therefore had to be accompanied by a clear description of the trade concerned, and every effort was made to ensure that the description should give an accurate average picture of the trade for the country as a whole. This was particularly important in a scheme that aimed at a uniform national programme of training.

A fuller description was obtained by adding the possible fields of activity in a given trade and a list of the main machines and tools normally used in it. The general description, the fields of activity and the list of machines and tools made it possible to fix precise demarcations for each trade.

Once a trade had been clearly defined the second major problem was to draw up a work-process schedule specifying the processes in which experience is to be gained and the number of hours of training to be devoted to each. The original idea behind the use of such a schedule in modern apprenticeship schemes is that it is the only possible means of controlling on-the-job training involving the use of a number of different skills.

In the Egyptian scheme, however, training is not given entirely on the job because the first year is spent in a training centre. There

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is thus full supervision during the first year, and a work-process schedule is unnecessary during this period. There is, however, another way of looking at the question; for it may be argued that, since on-the-job training is a continuation of instruction at the centre, a work-process schedule covering both periods is necessary if training is to be properly co-ordinated throughout apprenticeship. These two viewpoints were considered carefully, and finally the latter solution was adopted with some modifications.

Since the conditions of training are entirely different during the two periods, it was decided to draw up two separate schedules which together would give the required over-all training programme. But, since the schedules were independent of each other, it was possible to include in the schedule for the centre items which could not be taught on the job; for example it might be specified that a certain amount of training in "related trades" should be given. It was also felt that a separate schedule for the centre would give valuable guidance in the preparation of the detailed programme of the basic courses. This has proved to be of the utmost importance when new training centres are designed. A method has now been devised whereby it is possible to determine in advance, from the work-process schedule (or schedules if more than one trade is involved), all the training facilities that will be needed during the period spent at the centre.

In one way the absence of clear trade definitions in Egypt may be an advantage as compared with countries where labour organisations impose trade classifications and working conditions which are not always intended to benefit trade and industry. The free employment conditions in the country did, however, cause certain problems when the work-process schedules were drawn up, particularly because a nation-wide apprenticeship scheme was desired. Another factor which further complicated the issue was that in Egypt only part of a trade is practised in many undertakings, depending on the type of concern and the system of work applied. A solution had to be found, and, since in some of the larger undertakings, and especially in state enterprises, the different trades are fairly well defined, it was decided that the conditions in these undertakings, the influence of which on the local employment market over a considerable period showed them to offer a reasonably fair average sample, should be taken as a basis. The trade descriptions and the work-process schedules obtained in this way were further checked by discussions with experienced men in trade and industry.

It was not possible to follow this procedure in every case, and in some trades, such as tanning, committees had to be formed consisting of three or four experienced representatives of the trade concerned and a representative of the Department ; they made the necessary inquiries prior to working out trade descriptions and the work-process schedules.

Long discussions took place on the length of the period of apprenticeship. The period is, in fact, influenced by a great variety of complex local factors, including—

(a) the scope and level of the general education given in schools, particularly in such subjects as mathematics, science and the industrial arts;

(b) the compulsory school-leaving age, which determines the minimum age of admission to apprenticeship and consequently influences the ability of the average apprentice to assimilate new knowledge;

(c) the effect of the environment in which the apprentice has been brought up;

(d) the attitude of employers; much can be done to reduce the training period if employers fully realise the benefits of organised training;

(e) the attitude of the local skilled worker to training in general and to newcomers in the trade; the skilled worker instructs the apprentice on the job, and his attitude is thus naturally important;

(f) the levels of skill and knowledge required by local industry.

Comparisons with foreign systems could only be of limited value because local conditions in Egypt are very different from those elsewhere. But Egypt had no previous experience in this field and therefore had to seek further information on the subject abroad. When it was considered that in the Egyptian scheme the basic skills of a trade are taught at a training centre—an arrangement which should help to reduce the training period—it was decided that three years would be a reasonable period of apprenticeship. Consequently the syllabuses for most trades provide for a period of one year at a training centre and two years on the job.

General education in Egypt is given in three stages. The child first goes to a primary school when he is 6 years old. After six years there he goes to the preparatory school, where he stays for three years. Then follow a further three years at a "secondary school", at the end of which successful pupils are awarded the secondary school certificate, which entitles them to enter a college or a university.

A decision had to be taken as to the minimum level of education required to enter apprenticeship. The problem was whether admission was to be reserved for persons who had completed their secondary schooling or whether holders of the preparatory school certificate might be admitted as well. It was decided that the preparatory school certificate was sufficient and that, during apprenticeship, the pupil would, besides trade subjects, be given instruction designed to raise his general knowledge to almost the same level as that of the secondary-school pupils.

This decision automatically settled the question of the minimum age for admission, which was fixed at 14 years. As for the upper age limit, it had to be borne in mind that training was to be given, not to individuals, but to groups of boys, and that if it was to be effective the members of each group would have to be as uniform as possible in all respects, including age. Four years' difference between the ages of the youngest and the eldest was considered reasonable, and the upper age limit for admission was therefore fixed at 18 years. In practice most of the boys admitted are between 15 and 18 years of age.

To ensure that only the right boys are selected, and to avoid the wastage of time and money which may result from the acceptance of pupils who may later prove unfit, it was decided to use proper selection procedures. Each candidate is therefore required to undergo a medical examination to ensure physical fitness, a series of psychological tests and a personal interview.

Some undertakings required preference to be given to the sons of their workers and employees. They were told that the Department could not but encourage this as it would no doubt redound to the benefit of the scheme. The main principles, however, could not be abandoned. If the sons of workers and employees met the conditions for entrance they would be given priority of admission to training in the undertakings in which their fathers were employed.

PILOT TRAINING SCHEMES

The first pilot scheme, involving four employers and 50 apprentices to be trained as fitters, turners and machinists, started in October 1957 at one of the well-equipped trade schools at Heliopolis, a suburb of Cairo. The school agreed to make its workshop space, tools and materials available, and some of its skilled instructors were also hired to train the apprentices under the supervision of the Department's newly appointed officers and an expert of the I.L.O.

The basic training syllabus is made up of four parts—an induction course, a general metal-working course, a course in related subjects, and, finally, a specific course.

The short induction course, lasting about a week, begins immediately the apprentice joins the centre. It is intended to help the new apprentice to feel at home, to give him some idea of the centre's day-to-day activities, to allow him to get acquainted with his place of work, and finally to introduce him gradually to his trade so that he will not feel that a major upheaval has taken place in his life.

During the general metal-work course the apprentice is trained in the basic metal-working processes such as measuring, marking off, chiselling, sawing, filing, drilling, tapping, threading, etc.

In the course on related subjects he is given short training in industrial processes which do not come directly within his trade but are connected with it. For example, an apprentice turner will be given training in such matters as milling, shaping and foundry work. At first sight the value of this additional training may appear doubtful; but a more thorough examination of the subject will show that some knowledge of related trades is useful for the following reasons:

(a) A worker who has some idea about industry as a whole is more broad-minded, and consequently more useful, than one who knows only his own trade.

(b) A knowledge of related industrial processes makes it possible for the worker to appreciate the value of work done by his colleagues. For example, if a turner receives a part that has been partly finished by a machinist, his general knowledge of machinist's work will enable him to appreciate the amount of work done by his colleague, and he will therefore handle the part carefully. The importance of such an attitude in the maintenance of high standards of production is obvious.

(c) A worker who has some knowledge of the trades related to his own will better understand their value. This will make for mutual respect and co-operation and to better industrial relations in general.

The specific course deals with the actual processes of the trade which the apprentice is to learn. Both the specific course and the general metal-work course in fact supplement each other, for both are essential to the trade.

A major weakness of this scheme was that it came into operation before work-process schedules based on proper trade definitions which are essential in any apprenticeship training scheme—had been drawn up; the programmes therefore did not have the properly defined aims which are necessary in a national scheme. Nevertheless, much was learned from the Heliopolis project, and the resulting experience was of great value later on.

None the less, syllabuses framed on these lines have been found satisfactory and are now used in all the Department's centres. The work-process schedule clearly reflects the four parts mentioned. The Heliopolis Training Centre was only a temporary scheme designed to provide experience which would be of value when more extensive projects were undertaken later ; it was closed down when the first group of boys had completed the basic course.

In 1958-59 four new centres were opened by the Department. A metal trades centre in Cairo, a metal trades centre in Alexandria and a metal and automobile trades centre in Cairo were opened in October 1958, and a metal and automobile trades centre in Alexandria was opened in October 1959.

It was decided that each of the four centres should provide training in the metal trades of fitter, machinist, fitter-machinist, turner, sheet-metal worker, welder and blacksmith, and that in the two metal and automobile trades centres training should also be given in the trades of automobile mechanic and automobile electrician. Although these trades are by no means similar they can be considered to form a "family of trades", at least from the training point of view.

The two metal trades centres were of the same pattern. Each of the metal and automobile trades centres was in fact a metal trades centre with an extra section providing training in the automobile service trades. Since the same problems were met in all four centres, the metal trades centre, in Cairo (known as the Dokky Metal Trades Centre) will be taken as an example for the purposes of this article.

It is also financially advantageous to group these trades at one centre because many of the machines required can be used for more than one of them. A forge, for example, is needed for the related course of the fitter-machinist, and with little extra equipment it can also be used to train blacksmiths; thus it stays idle for less time, and better use is made of the capital invested.

The only one of the trades mentioned which gave rise to any difficulty was that of fitter-machinist, because there was some doubt as to whether this trade was really needed by local industry.

The fitter-machinist naturally combines the functions of a fitter and a machinist—in other words, he can do fitting work and can operate machine tools as well. He is thus particularly useful to the many small and medium-sized maintenance workshops in Egypt.

Although the term "fitter-machinist" is unknown locally, investigations showed that this trade is by no means new to the Egyptian employment market. Most highly skilled fitters in fact do master fitting and machine-tool work as well, and in many undertakings fitters are required to engage in both kinds of work. Lathe work is not included because turning is recognised as a separate trade in Egypt. After discussion it was therefore decided to include this trade in the Dokky centre's training programme.

When the Department set up its first training centre at Dokky, it admittedly had very little experience in this field. But more and modern training facilities were badly needed, and lack of experience could not be allowed to slow the scheme down. The Dokky centre could, in a sense, be considered as a continuation, on a larger scale, of the experimental work begun in the Heliopolis centre, on the experience of which it had been based.

The training facilities provided for the trades covered by the Dokky centre's syllabus were based on assumptions and estimates adopted following discussions on the machines, equipment, etc., that would be necessary and reasonable. One of the weaknesses of the Heliopolis scheme was repeated in the organisation of the Dokky centre ; the facilities were decided before the standards and workprocess schedules for the above trades had been drawn up. To be fair, however, one should remember that it was very difficult, if not impossible, to foresee at that time all the matters which are now considered as points of weakness. In any new experiment these only become apparent as work proceeds. Work-process schedules were then known only in connection with on-the-job training, and it was quite impossible to foresee how they might affect a scheme providing training both in centres and on the job except by actual experiment.

Building of the Dokky centre was finished before the workprocess schedules were ready. The draft schedules were in fact only finally agreed upon some months after the first group of apprentices had joined the centre, and even then the real relationship between work-process schedules and the training facilities required was not fully apparent.

Once the schedules were available it was possible to prepare a training plan for the centre as a whole. This is really just a time schedule which shows the training activities of the apprentices in the different trades week by week in accordance with the workprocess schedules. It includes a rotation chart showing the positions of apprentices clearly at any time.

Although the original idea behind this plan was to provide the centre with a training timetable, it finally turned out to be something much more. Once a plan has been drawn up for a certain number of apprentices in different trades, all the training facilities required to train these apprentices can be estimated quite easily, and it is then also possible to ascertain the number and skills of the instructors required. It is thus a very handy and useful aid to those responsible for administering a new scheme and in practice it has proved to be extremely important when designing the new training centres which have been built since the Dokky centre first came into operation.

It was found that there were certain shortages and bottlenecks when the training plan for the Dokky centre was compared with the facilities already installed. For instance, only half the number of shaping machines were available for the number of machinists to be trained. In other words the shaping machines formed a bottleneck as a result of which only half the number of apprentices in the machinist trade could be accepted at the centre.

It thus became necessary to review the whole situation carefully, and measures are now being taken to put matters right. However, such contingencies can be avoided if a training centre is built in the first place on the basis of a training plan specifying all the facilities that will be needed when operations begin.

It was understood from the first that the building of training centres of the type needed for the Egyptian scheme would be costly. The following table shows the cost of building and equipping a metal trades centre similar to that at Dokky.¹

Item (i	Cost n Egyptian pounds)
Land	15,000
Buildings	60,000
Power installations	10,000
Machines and equipment	90,000
Furniture, office equipment and transport facilities	10,000
Total	185,000

It is obvious that training centres must operate at full capacity if the cost of training each apprentice is to be kept to a minimum.

The Dokky centre was designed to accommodate 90 apprentices in the branches of the metal trades mentioned earlier. When the training plan for the centre was examined, however, it was found that some of the machines and equipment installed were standing idle for much of the year, and it was therefore necessary to find a more uniform workload programme on the machines. One suggestion was that this could be done if, instead of admitting all the boys in October, one batch was admitted each quarter ; this method kept machine-loading at a fairly steady level over the year. Further study showed, however, that such a procedure would involve

¹ These figures are based on estimates for the centres which are to be built in 1961 and 1962 and which have been designed in the light of experience gained during the Dokky experiment.

endless trouble from an administrative point of view. A happy compromise was therefore found, and two groups of boys are now taken each year in October and April respectively. The result of this measure has been to raise the capacity of the centre from 90 to 130 apprentices per year.

Most of the training syllabuses now in operation were prepared by committees comprising technical teaching staff and persons with experience in the industrial field concerned.

In most cases the programmes have been based on the personal experience of the members of the committees, although in some cases courses in other countries have been used as a guide. The latter are no doubt useful; but they must be referred to with care because the limits of any one trade may differ from one country to another.

One of the main problems encountered in these committees has probably been that some of the members tend to be too academic and suggest syllabuses that go beyond the needs of a skilled worker. This tendency can only be interpreted as a lack of understanding of the philosophy of apprenticeship and it must be carefully controlled. To counterbalance this attitude it is essential that the committees should contain skilled workers who really understand the needs of the trade and are able to make positive contributions to the committees' work.

The present syllabuses are by no means necessarily definitive; much still remains to be done in this field. They will probably be developed in the light of the experience gained in the centres, and the views of those supervising the on-the-job part of the training scheme will also be of considerable value in the future.

INSTRUCTORS FOR TRAINING CENTRES

An instructor who is to train apprentices should have sufficient experience in the different manual skills of the trade, a good grasp of its theoretical aspects and the necessary teaching ability, together with, preferably, some previous teaching experience.

It was not easy to find suitable instructors possessing all these qualities; this was in fact one of the major problems that had to be overcome, because it was quite clear that the success of the scheme largely depended on the availability of suitable instructors.

Two types of candidate were available, namely men who had started their careers as helpers and graduates from trade schools. Persons of the former type are reasonably experienced in the manual skills but do not normally have an adequate grasp of the theoretical aspects of the trade; while persons in the latter category have comparatively more knowledge of the theoretical aspects but less experience in the manual skills. Neither type therefore possesses all the qualifications required for a good instructor. The best use had to be made of the resources available, and the most logical solution appeared to be to employ two instructors working as a team. From this approach developed the idea of having instructors and assistant instructors; and this was the solution adopted as a temporary measure pending arrangements to upgrade the teaching staff.¹

The appointment of assistant instructors was later found to be unsatisfactory, as workers with insufficient knowledge of the theoretical aspects of their trade proved to have only limited ability as instructors. This system has therefore now been abandoned.

It must be admitted that the problem of finding instructors is still an acute one. Some time will, naturally, be needed before the instructors available can be considered suitable. However, various steps have been taken. Every new instructor attends a 17-week course, one part of which deals with such subjects as psychology, teaching methods, human relations and safety, while the other is designed to raise the theoretical knowledge of the instructor in trade technology and drawing. Those who pass the examination attend a further 16-week course in which more advanced levels of trade technology and drawing (and also mathematics) are taught.

Lately, there are upgrading courses to improve skills in some metal trades (turner, fitter and welder), which newly appointed instructors with insufficient shop practice are required to attend. Each course lasts for about three months.

Instructors can also draw on the experience of "chief instructors" provided by the I.L.O. or hired from foreign countries. In certain cases, instructors have been sent abroad to attend special courses and gain on-the-job experience.

The I.L.O. has also agreed to give assistance in the establishment of a centre especially for training instructors which, it is hoped, will eventually offer a final solution to the problem.

On-the-Job Training

After completing the basic course at a centre the apprentice is transferred to the employer's plant. There he gains further experience by applying the basic skills he learned at the centre in real production work. Conditions on the job, and the problems which arise, are obviously different from those at the centre. The main

¹ Training and upgrading courses for instructors were subsequently introduced later on and are gradually being developed.

characteristic of the on-the-job problems is the fact that they are not as easy to keep under control as those arising at the centre. In drawing up the plans for a new scheme this problem has to be taken into consideration.

Of the many elements which influence training on the job the skilled worker who instructs the apprentice himself is of major importance. His levels of skill and knowledge are inevitably of considerable effect. He clearly cannot teach the apprentice more than he himself knows. These workers often acquired their knowledge of their trades through the old apprenticeship system, and consequently many of them cannot be considered as "modern skilled workers" of the kind required to impart proper on-the-job training in a modern apprenticeship system. This weakness is, however, less important where both training in a centre and on the job are combined in a single course. When the boy joins his employer's plant he already has the basic skills of the trade and is able to apply them in the proper way. The role of the centre in bringing about these conditions is of great importance.

The solution to this problem will obviously be a long-term one. With the introduction of modern training schemes, conditions will gradually improve until it eventually disappears. Certain measures can, however, be taken to help improve the situation in the short term. Arrangements can, for example, be made to upgrade at least some of the workers employed by each undertaking. Standard upgrading courses in the main metal trades are now given at one of the Department's centres in Cairo, and similar facilities will in the near future be made available in Alexandria. The I.L.O. is helping to organise these courses.

Another important factor is the attitude of the workers already on the job towards the apprentice. Some of them inevitably tend to look upon the apprentice as if he belongs to a different class. Although undesirable, this attitude is only natural. In fact it is the normal behaviour to be expected in a transition period in which old and new meet. It is the duty of the training supervisor in this case to establish friendly relations between the two parties and to explain clearly to the workers that apprentices must never be treated as a group apart.

The attitude of the employer is also of great importance. It has been found that employers fall into three categories. Some are easy to convince of the benefits of the scheme and give full co-operation from the beginning. Others adopt a diametrically opposite attitude. In between these two categories comes the third group, which shows apparent conviction but gives only little attention to the needs of the scheme. It is employers of this type who provide the most problems. Whatever the employer's attitude may be, it is only natural that he should be unwilling to act on a new idea until he is sure it will be to his advantage to do so. But a good idea will sell itself, and once employers are convinced of its benefits they will accept it and co-operate. However, not all employers become convinced with equal rapidity, with the result that much patience is required on the part of those responsible for the scheme.

That this patience pays can be seen from the following examples. Two undertakings which previously made use of the Department's training centres have recently applied for centres to be established solely for their own use. Another undertaking has asked for the Department's assistance in the construction of its own training centre. It is encouraging to mention that this was suggested by the Department some four years earlier, but the undertaking concerned had not taken any action.

The role of the on-the-job training supervisor (a state official) in the conditions described is by no means easy. The success of the scheme depends to a great extent on him. To be able to perform his complicated work he needs a considerable degree of patience and must know how to handle the problems raised by employers and workers, whose motives he must obviously understand and appreciate if he is to cope with the various situations. The preparation of supervisors for this important job by means of a special course will certainly help to make the scheme run more efficiently.

It has been observed that in some cases the apprentices have been given work outside the trade or asked to do "repetition work" despite the fact that the work-process schedule is clearly indicated in their record books, in which all their activities are registered. In a new scheme this must be considered as lack of understanding of the philosophy of modern apprenticeship rather than misuse of the scheme, and it is the duty of the training supervisor to explain to foremen and workers the benefits of adhering to work-process schedules. It is, however, to be noted that these people are always extremely susceptible to any hint that they do not know the needs of their trades. A good supervisor will bear this in mind when trying to enlist their co-operation.

A co-operative approach in the field of training can solve many problems, such as the following one : a large undertaking asked for apprentices to be trained in the different metal trades to operate new plant being installed; no additional skilled workers were available at the time owing to the demands of the national industrialisation programme. There was no serious problem in making the necessary arrangements for the first year of training, and some of the Department's training centres ran special afternoon courses for this purpose. When the basic training was over a more serious problem had to be faced: the provision of facilities where the boys could be given on-the-job training. Arrangements were made with 43 undertakings to accept some 490 boys for training at their shops, and the firm which applied for the apprentices willingly accepted to pay all the ensuing expense. In certain cases the boys had to be shifted from one undertaking to another so that training in all the skills required for the trade could be given.

So far the percentage of wastage in the general apprenticeship scheme has been very small. Out of 2,147 apprentices in metal and automobile service trades admitted to the centres in Cairo and Alexandria up to October 1960, only 99 boys, which is about 4.5 per cent. of the total number admitted, dropped out. Compared with data from other countries this percentage is very reasonable. To some extent it can be attributed to good preliminary selection, which, as previously explained, is one of the main characteristics of the Egyptian scheme.

Conclusions

The experience gained in setting up the new apprenticeship scheme in Egypt may serve as a useful guide in other countries where conditions are similar.

In the first place, all possible causes of confusion must be eliminated; for example a definition of the term "apprenticeable trade" must be decided at the outset, otherwise much time will be lost in unnecessary discussion.

In the absence of clear trade definitions it is essential that these should be agreed upon as a first step towards working out the necessary standards; but this can only be done after a thorough nation-wide study of each trade.

The experience of other countries can serve only as a guide, and in many cases has to be adapted to local circumstances. Foreign advisers can do good work only if they approach their task in a flexible frame of mind and are prepared to appreciate local difficulties and understand local conditions.

The part to be played by employers and workers must be carefully considered. While it is true that the principles of good apprenticeship imply the fullest possible participation by both, it is to the benefit of all to accept the facts as they are and to ask no one to undertake more than he really can or is prepared to do.

The following further general remarks can be made in the light of experience acquired in Egypt :

1. It is most uneconomical to have more than one person in command on the training field. Measures should be taken at the outset to ensure that there is only one responsible party, at least as far as planning and supervision are concerned.

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2. Caution is recommended in the initial stages for those who have no previous experience of training schemes. It is desirable, on economic and other grounds, to limit the number of experimental centres and to keep them running over longer periods.

3. The principle of providing a training centre for a family of trades is a good one, although in certain cases it may be preferable to have specialised centres. If the number of apprentices justifies their establishment, specialised centres are worth considering for such trades as that of motor mechanic or welder.

4. Problems arising in the early stages will only disappear once sufficient experience has been acquired. Experience abroad can only help to shorten the experimental period; it will not necessarily be useful as a means of avoiding problems. In setting up new centres it is advisable to provide temporary buildings in the first instance which can be adapted or extended in the light of future developments. Any alterations required in the course of training can thus be made easily, and once conditions are more stable permanent buildings can be put up.

5. There are some arguments in favour of building a number of small training centres in different parts of a city rather than a single large one. The writer believes that the choice of one large centre is also worth considering particularly because modern means of transport today put every part of a city within reach of all its inhabitants. The large centre is also a more attractive proposition from the point of view of economy and efficiency.

6. One serious problem in training is the shortage of written technical material available for skilled workers. Every effort must be made to ensure that adequate material is provided in special trade libraries at the training centres.
