

TRAINING CONTRACTORS FOR RESULTS A GUIDE FOR TRAINERS AND TRAINING MANAGERS

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PREFACE

This guide on the development of local construction enterprises through training has been prepared as part of the ILO's contribution to the goal of greater self-reliance in construction at the national level. An earlier book by two ILO professionals concerned with the construction industry¹ argued that it was the institutional framework regulating the construction industry in developing countries which effectively constrained the emergence of a strong and resourceful local contracting industry. Then a further volume² took this argument a stage further by offering a series of alternative strategies to overcome these regulatory constraints, including a detailed scenario for comprehensive development through a Contractor Development Agency (CDA) which would act as a potential channel for assistance and as a catalyst for effective action.

This guide is explicitly concerned with training contractors for results. Accordingly its main concern is to offer advice on how a successful training programme for building contractors can be prepared and run. It is written in the recognition that effective training will not solve all the myriad problems facing domestic construction industries in developing countries, but in the firm belief that training has a part — and an important part — to play. This belief is not based upon idle speculation. The ILO was one of the first international organisations to investigate the managerial constraints upon construction performance, and to recognise the unique features of construction management as a sector-specific discipline. It quickly became clear that training was badly needed, but that the results from training transposed, ready-made, from other sectors or other operating environments were disappointing. Thus a great deal of time and effort has been expended over the last decade to develop approaches that work, and this guide represents the outcome of developing and testing a range of different training concepts and

methodologies for contractors in Africa, Asia and Europe.

We make no apology for reiterating the emphasis on training contractors for results. Contractor training is pointless unless the results can be seen in terms of improved performance in delivering projects on time, at an acceptable standard of quality and within cost targets. It is written primarily for trainers and training managers, but we hope that policy-makers will also find it useful, as it discusses a comprehensive approach to improving the performance of contractors through training. The guide is oriented towards managerial training of contractors, although many of the principles and ideas should be of general interest to those interested in either developing the construction industry or developing new approaches to training, or (even better) both.

Tor Hernes developed the Interactive Contractor Training methodology during a four-year ILO assignment, and is now an independent consultant in the field of construction management training.

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Notes

¹G. A. Edmonds and D. W. J. Miles: *Foundations for change* (London, Intermediate Technology Publications, 1984).

²ILO: *Guide-lines for the development of small-scale construction enterprises* (Geneva, 1987).

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The ILO also wishes to acknowledge the pioneering organisations in contractor training and development who have contributed both directly and indirectly to the synthesis of thought and experience that this guide represents. In particular, we should like to acknowledge the help and co-operation of the Botswana Enterprises Development Unit, the Cyprus Employers' and Industrialists' Federation, the National Construction Corporation of Kenya and the National Productivity Centre of Malaysia.

Note: Since this book is intended for an international readership, we have used the term "NU" in the examples to represent an imaginary "National Unit of currency".

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INTRODUCTION

Wherever people are at work, their problems are in some way the concern of the International Labour Organisation. The development of human resources is a major issue, and within the general training area the ILO has been working for over 30 years to improve the quality of management performance. In the mid-seventies it began to develop specific management programmes for the construction industry, working in countries of Africa, Asia and the Middle East which include a broad range of varying environments and situations. These programmes comprise two major activities: training of construction project managers and upgrading the skills of building contractors. What is contained in this guide is the result of ten years of experience in training building contractors in developing countries, in particular those in the small- to medium-scale range.

The construction industry in developing countries typically employs 5-10 per cent of the workforce, quite apart from the additional employment in the various industries which have linkages with construction. Moreover, it is responsible for creating at least half of most countries' fixed assets, including health centres, schools, administrative buildings and infrastructure. It is therefore of national importance that it is run by competent managers at all levels, as well as by skilled workers.

The construction industry follows, perhaps more than any other industry, national economic fluctuations. Since these determine the market for the sector, the demand for the contractors' services, particularly in the case of developing countries, can change quickly from one extreme to the other. The day-to-day problems are also considerable. The contractor often has to meet tight money and time schedules executing complex projects in places where material and labour supplies can be both scarce and unreliable. Small- to medium-scale contractors have to

possess many skills if they are to succeed. The skills needed are those of a personnel manager, an engineer, a project manager, a company director and, perhaps most important of all, a good entrepreneur. To provide the contractor with such a variety of inter-related skills demands a particularly innovative and effective approach to training.

Training is normally an essential part of the upgrading of building contractors. It is also an extremely demanding, challenging and worth-while task. To contractors, attending a training programme is an investment of precious time. They invest their time to learn something which enables them to boost their businesses. Often, being self-made business people who face a daily struggle to thrive in a tough environment, contractors demand that training is practically oriented and reflects their situation. In short, they expect it to save them money or help them to work more efficiently. This places heavy demands on the committed trainer (or organisation) who is determined to achieve results.

Achieving results through training requires the use of a carefully chosen methodology, suitable material and high-quality trainers. The ILO has therefore experimented with various methodologies and types of material in the training of contractors. The production of material and testing have been carried out with extensive collaboration from local organisations and ILO field projects. As a result, it has been possible to identify the characteristics of methodologies which are essential for the success of a training programme and the types of layout and content of training material which contribute to effective learning. The results of this work are contained in this guide.

The guide does not, however, set out to specify precisely to trainers or training managers how a programme should be built up. Instead it is designed to help you as a trainer or training manager to analyse the factors that determine the success of contractor training. Trainers are creative individuals who use their ingenuity and awareness to create a situation where people improve through learning. So we ask you to analyse what you read and relate it to your own experience. If you are in agreement with the principles contained in the guide, we hope that your confidence and competence will be increased. Even if you do not agree, the guide will at least have helped you to analyse the process of training, and

should therefore help you to increase your effectiveness as a trainer.

The expression "training of contractors" is used throughout. This should not be construed as "education", "teaching" or "instruction", because those terms imply that learning is received from a single source of competence, which is normally thought to be the trainer. Instead, training should be seen as facilitating a process by which the contractors' skills are improved. In this process the effective trainer is more of a catalyst and organiser of learning than a teacher.

The reader is also owed a note of explanation on the use of the word "contractor" in the guide. This does not necessarily refer to the owner of the company. In the case of the very small contractor this would be the case, but when bigger construction companies with divided responsibilities are involved, we define training the contractor as training those staff who have some form of managerial responsibility for the performance of individual projects or the enterprise as a whole.

the purpose of the guide

This guide is addressed principally to trainers and managers of training institutions, but we hope that it will also be of interest to policy-makers, who are in a position to fund the initiation of contractor training programmes. Eventually, indeed as soon as possible, such programmes should become self-financing. But there are few countries where associations of domestic contractors are sufficiently strong and self-confident to start training programmes without outside impetus. Meanwhile, much larger sums of money are wasted by or on behalf of clients who suffer from unrealistic bids, cost increases, late delivery and excessive maintenance costs due to inadequate initial construction quality. Thus, although the prime purpose of this guide is to provide advice on how to train contractors, we hope that it will also make the point that contractors can be trained, and that the economic results of effective contractor training can show most encouraging rates of return on the relatively limited investment that training components in technical assistance projects generally represent.

CONSIDERATIONS FOR DESIGN 2 AND IMPLEMENTATION

is training the only solution?

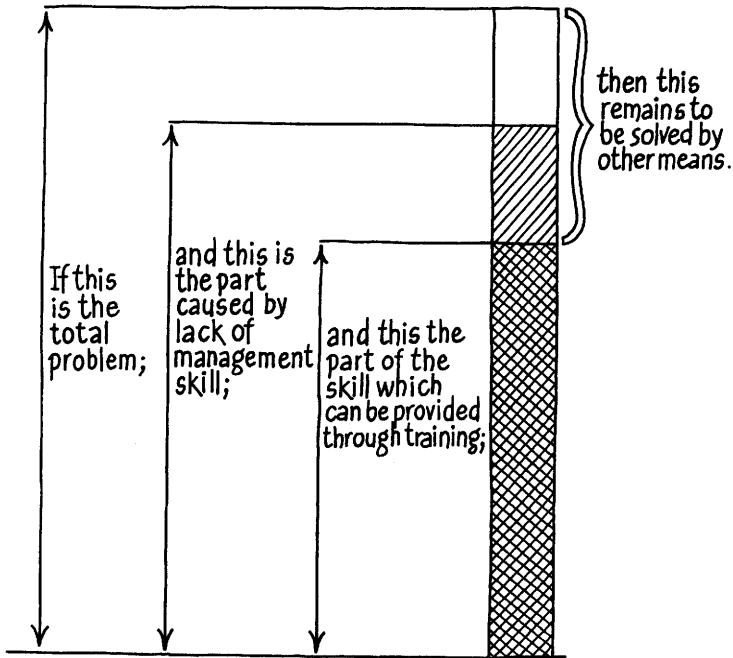
Most people agree that education is a "good thing". It does not necessarily have to be justified in terms of financial return. Training is different. The objective of a construction management training programme is improved performance in terms of time, quality and cost. Thus, before a training programme is authorised the potential benefits should be carefully analysed and quantified. Indeed there are some problems which cannot be solved by training alone. For building contractors in developing countries, for example, there are numerous problems which cannot primarily be traced to a lack of managerial skill, such as difficult access to finance, fluctuating materials supply, shortage of skilled labour, delayed payments from clients, and so on. For such problems, training will certainly be useful, but it will not in itself be sufficient.

This does not mean that there is no point in running a training programme unless the other constraints on the contractors' performance can be solved first. On the contrary, launching a training programme is often a good first step. It is important, however, to be aware of the limitations as well as the potential of a training programme. Figure 1 shows how training may be only a partial solution to the problem.

DIFFICULTIES AND CONSTRAINTS

The difficulties which singly or in combination can seriously constrain the performance of small contractors come under three headings:

Figure 1. Solving the problem



- (i) difficulties presented by the particular market and business environment in which the contractor is operating. These include —
- procuring work on a steady basis;
 - access to investment and working capital;
 - shortages of skilled labour;
 - delays and uncertainties with respect to materials supplies and prices;
 - access to hired plant and equipment;
- (ii) difficulties deriving from clients, including —
- incomplete or unclear drawings and specifications;
 - inadequate supervision by clients;
 - delayed interim and final payments;
 - unwillingness to renegotiate contract deadlines in response to unforeseen delays in the availability of materials;
- (iii) difficulties deriving from the personal shortcomings of the contractor. In particular, common issues are —
- deficiencies in technical understanding of drawings and specifications;

-
- lack of familiarity with estimating techniques and tendering procedures;
 - unfamiliarity with the legal aspects of contract work, contract law, and preparation and negotiation of claims against contract variations;
 - lack of understanding of basic site management and contract planning techniques and financial analysis;
 - lack of diligence in keeping physical and financial records and in general bookkeeping.

Some of these problems are inter-related. For example, "access to investment and working capital" is listed under (i), but is related to the last point under (iii), "Lack of diligence in keeping physical and financial records and in general bookkeeping". If the contractors upgrade their skills in keeping proper records, their respective lending institutions may be more willing to lend them money.

STUDYING THE SITUATION

Finding which constraints are most important and how they can be removed can be done only through a study of the characteristics of the local construction industry. The study should examine all factors that relate to the contractors' performance. Data can be obtained from several different sources: contractors, clients, financial institutions, Ministry of Works officials, civil engineering consultants, and so on. The findings of the study should be presented in a formal report and, once its contents have been generally agreed, it can become a working paper for the formulation of a plan of action for upgrading the performance of contractors.

IDENTIFYING SOLUTIONS

Once a study has been carried out and the problems and their relation to one another identified, the next step is to identify the possible solutions. There are basically three groups of solutions, as shown in table 1.

A successful approach to upgrading the skills of building contractors requires the use of a combination of different solutions. The use of an integrated approach is described in the ILO companion publication, *Guide-lines for the development of small-scale construction enterprises* (Geneva, 1987).

Table 1. Three groups of solutions

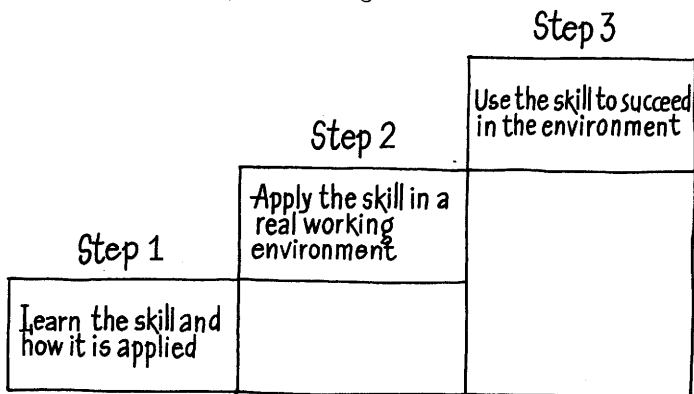
Policies to improve access to work	Policies to improve access to capital, materials and equipment	Training and advisory services
Examples: <input type="checkbox"/> Price preferences <input type="checkbox"/> Improved tendering procedures <input type="checkbox"/> Prequalification procedures <input type="checkbox"/> Encouragement of subcontracting	Examples: <input type="checkbox"/> Loan guarantee schemes <input type="checkbox"/> Improved payment procedures <input type="checkbox"/> Improved access to materials and equipment <input type="checkbox"/> Reduction of retention money	Examples: <input type="checkbox"/> Setting up an organisation for training and advisory services <input type="checkbox"/> Creating a forum for the contractors to discuss problems and receive training <input type="checkbox"/> Training publications

From here onwards in this guide, attention will be focused on training and advisory services only.

TRAINING AND ADVISORY SERVICES

The purpose of management training is to help individuals or groups improve their performance by providing them with the relevant skills. Acquiring a management skill and practising it with success requires a special learning mechanism. This mechanism works in the same way whatever the external constraints on the contractor are. It consists of three steps, as shown in figure 2.

Figure 2. Three steps to learning



STEP 1 This can and should be achieved through training sessions. It should be noted that it means learning a *skill*, which implies that the training must be practically oriented, that is, tailored to the needs of the participants and presented in an effective learning environment.

STEP 2 This is a natural outcome of step 1. If the course has been useful, the contractors will try to apply the skill. However, no matter how realistic were the exercises or case studies used in the course, they will not have simulated all the factors which the contractors encounter when applying the skill to their own situations. If they try and fail, discouragement will set in and there will be a danger that they will dismiss the skill as inappropriate to their need. To overcome this danger, contractors should be able to call upon the assistance of advisers or other contractors when necessary. Thus, in order to achieve step 2, on-the-job support is needed, probably in the form of an advisory service of some kind.

STEP 3 This is surmounted when the participant effectively uses the skill to succeed in the environment. An example is a contractor who learns the basics of estimating (step 1), practises it to prepare tenders (step 2) and then uses the skill to prepare tenders which are high enough to earn a reasonable profit, but sufficiently low to win the contract (step 3).

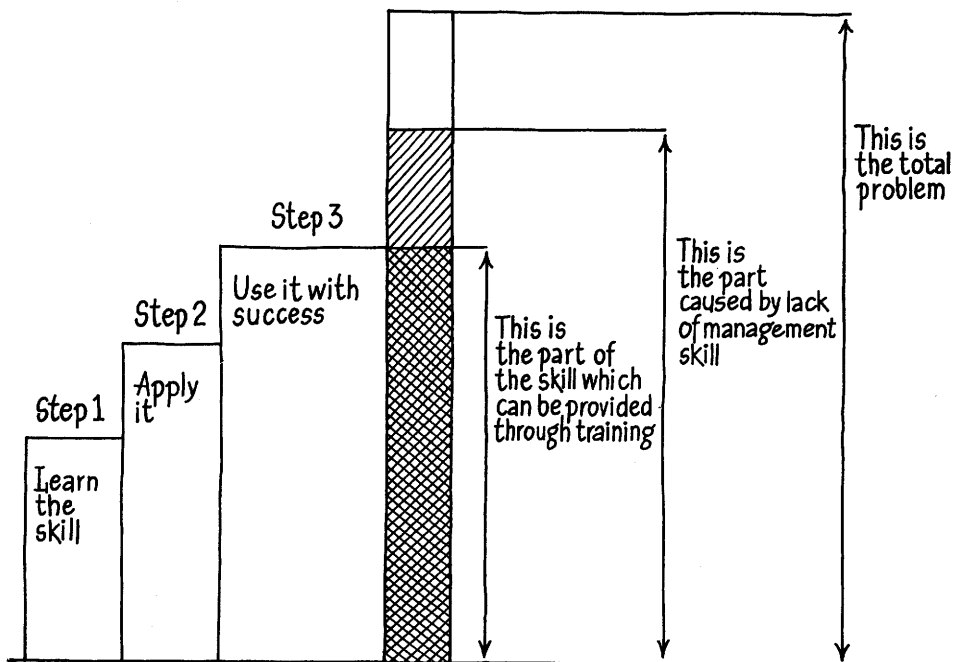
Step 3 is related to the operational environment, which includes competitors, clients, suppliers of materials and the workforce. Succeeding through using the skill cannot be effectively learned from a training course. Advisers or consultants are one potential source of help. However, the best way of achieving step 3 may be a form of action learning where the contractors *learn from each other* how to apply the acquired skills successfully. In most cases, a tangible performance improvement can only occur when step 3 has been reached.

Following from this, the answer to the question "What can training do?" is that it depends on the amount of resources that are available to be put into the programme. Each of the three steps requires inputs of money and human resources. If the inputs are just enough to implement step 1, the performance improvements are likely to be limited. If, on the other hand, enough time and money is invested to achieve step 3, there is a good chance of achieving the desired performance improvements. This requires an

integrated training programme with a relevant methodology and on-the-job assistance.

The objective is to solve that part of the overall problem which is susceptible to solution through training. Effective training will not solve all management problems, although it should make a major contribution. Equally it is true that good management cannot overcome all the problems that result from an unfavourable regulatory environment. However, the message of figure 3 is that, once the three "training steps" have been climbed successfully, the summit of target performance should be within reach.

Figure 3. Training steps towards target performance



THE USE OF ADVISORY SERVICES

Since construction management is a practical discipline, the final proof of success is improved on-the-job performance. If the training is well designed and effectively delivered, the participants may be sufficiently motivated and skilled to achieve this without further assistance. More frequently, however, the optimum approach is to support the formal

training sessions with some form of on-site (or possibly in-office) advisory service. An "advisory service" is used in this guide as a term to describe organised on-the-job assistance offered to contractors to help them solve specific and immediate problems. Experience shows that such services are most effective when used in conjunction with a training programme, so as to help the contractors implement the skills they have learned.

In addition to helping the contractors implement the skills, an important advantage of advisory services is that an objective evaluation of the contractors' performance improvement can be obtained. An adviser or consultant is able, by visiting the contractors, to monitor how well they practise the skills and, in many cases, how these affect their performance. This enables trainers to obtain valuable information which they can use progressively to improve the content of the programme.

setting objectives

Setting objectives means deciding what is to be achieved through training. Examples of types of objectives are to raise performance to a specified level, to eliminate a certain percentage of cost and time overruns, to enable a certain number of local contractors to be competitive with bigger, foreign-owned companies or to improve working conditions in the industry. The objective is the basis for the entire programme because it determines the input of resources and the way in which the programme is to be organised.

It is important to distinguish between objectives and activities. To say that "300 contractors are to be trained in site management" is not stating an objective, but denoting an activity. The objective is a measure of the conditions after the training has been completed. In the case of the 300 contractors, for example, a possible objective would have been to say that "following the training, more than half of the participants will be organising and running their sites with a 20 per cent reduction in waste of time, money and materials".

A training programme may well have more than one objective. It may be helpful, for example, to state a specific

performance improvement in addition to increased competitiveness. However, when two or more objectives are stated, there should always be one main objective.

WHY SET OBJECTIVES?

By formulating objectives, training managers are forced to think through the programme. It is even possible that, having formulated specific objectives, they will find it necessary to modify the content or methodology of the training. This will have moved them one step closer to success.

Some trainers might argue: "I know why I am doing the training, so there is no need to write it down." But what they have in the back of their minds is not the same as objectives which describe explicitly the effects that the training can be expected to produce.

Training is an investment of time and money to improve the performance of a group of people. To find out whether it was worth while, the results should be compared with the inputs to see if the training has proved a good investment. This is the evaluation of the training. The results are measured against a given standard, which is provided by the objectives.

BEING SPECIFIC

"The objective of my training programme is to improve the way the contractors manage their sites." Is this a proper objective? First, what is meant by "improve"? Does it mean improving by 50 per cent or 200 per cent? Second, what is meant by "the contractors"? It should be specified how many or what percentage of the participants are to be brought to the stated performance level. An objective such as "to reduce the number of accidents on construction sites" is equally vague and will not provide a guide for the development of the training, nor will it suffice as a basis for evaluation.

It is difficult, particularly in contractor training, to quantify objectives, such as to say that "the training will enable the participating firms to reduce the direct site costs by 25 per cent". The industry is generally very complex, and is governed by many factors. There is therefore a certain risk associated with being too specific. However, it

is always worth searching for a measure which makes the objective as quantifiable as possible and which is at the same time based on realistic assumptions.

TAKING ONE'S TIME

Since the objectives become the overall guide of the training, they are also the standard by which the success of the training is to be measured. Therefore, it is important to take time to think them through and make them as realistic and specific as possible. Realistic is perhaps the most important keyword. Being realistic in this context means stating objectives which are neither over- nor under-ambitious. Objectives must match the inputs which can be reasonably expected to go into the training in the form of money, administration, transport, trainers and support staff. One ambitious objective may well make it easier to promote the training programme because the potential benefits seem impressive. However, the evaluation may be disappointing and even embarrassing if the objectives are not achieved. If the objectives are based on excessively high expectations, this will also have a demoralising effect on those who are to be involved during the implementation. On the other hand, if they are under-ambitious, the true potential benefits of the training will probably not be realised.

LONG-TERM AND SHORT-TERM

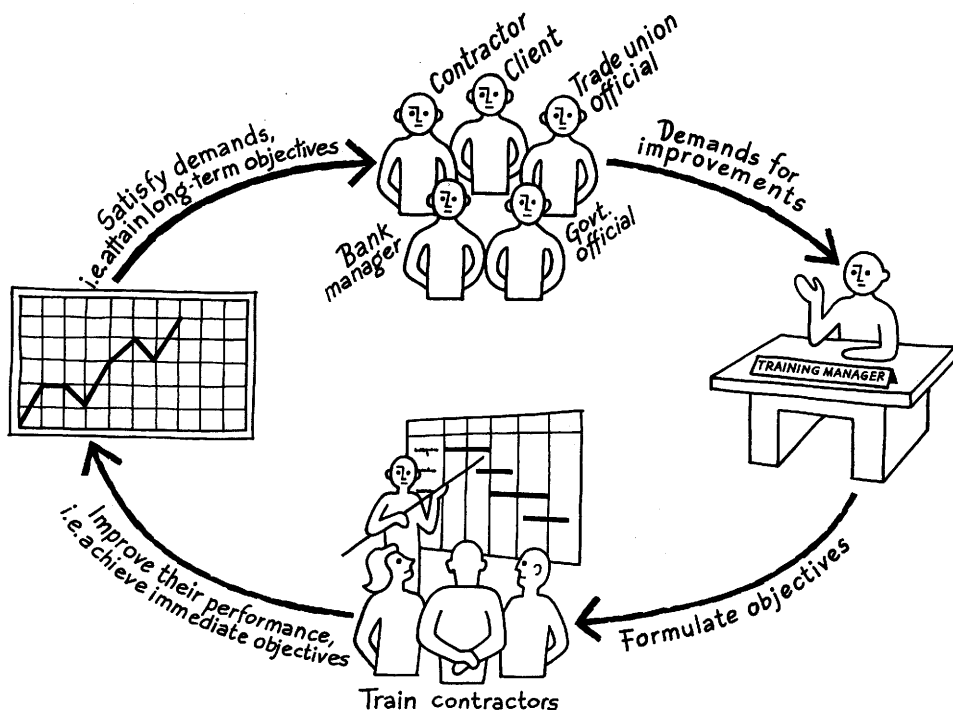
OBJECTIVES

Construction firms do not operate in isolation. Their performance affects clients, financial institutions, industry and society as a whole. It is normally these groups who suffer from poor performance and it is often their complaints which lead to the decision to train contractors. Contractor training may also be initiated as a result of demands from the contractors themselves. In doing this, they in effect determine the overall objective of the training, which then becomes the satisfaction of their demands. This overall objective is what we shall call the long-term objective. Examples of such long-term objectives are specified reduced savings by financial institutions or a specified reduction in the number of complaints from clients.

The short-term objective is normally attained through improved performance. When formulating the immediate objective, one should specify in what areas the training is expected to lead to improved performance. An improvement in performance starts when the participants begin to apply the skills learned during the training. Examples of improvements are better financial management, more efficient site organisation and improved capability to meet time and cost targets.

Figure 4 shows how demands for improvements lead to the formulation of long- and short-term objectives and achievements.

Figure 4. Formulating long- and short-term objectives



THE TARGET GROUP

The people to be trained form the target group, and should be specified when setting objectives. The target group can be described by trade, geographical location or the size or nature of the enterprises. The smaller the number of participants, the easier it is to run substantial programmes,

comprising a diversity of courses, follow-up sessions, workshops and on-the-job assistance. With an increasing number, the programmes have to be less sophisticated, but of course the cost per participant is reduced.

NUMBERS, OUTPUTS AND RESULTS

The immediate result of training should be an improvement in performance among the target group. Experience shows that the trainees are more likely to achieve a worth-while improvement if they know in advance what is expected of them. So objectives are of value to the trainees as well as to the trainer. Objectives should be specific in terms of numbers, outputs and results, so as to permit the estimation and evaluation of cost-effectiveness, the subject of the following section.

cost-effectiveness

A training programme is a process whereby certain inputs are turned into benefits through improved performance. The inputs are essentially all the activities which go into preparing and running the training, as listed in table 2. All these activities can and should be costed at the design stage to see if they are reasonable compared to the expected benefits. Examples of benefits are the improved financial health of a group of contractors, savings for clients and financial institutions, and better conditions for the construction workers. The benefits from the training can often be expressed in money terms and thus compared to the cost of the inputs. This is the basis for measuring cost-effectiveness.

The higher the cost-effectiveness of the training, the greater the benefits derived per unit of money invested. The cost-effectiveness in turn depends on the ingenuity of programme design and material, as well as the skills of the management and the trainers. It can be compared to a construction site; innovative methods, efficient management practices and skilled workers can make it far more successful than if conventional methods are used by average workers who are indifferently managed.

Table 2. Inputs to training programmes

	Input
TRAINING MANAGEMENT	<input type="checkbox"/> Planning and design of training <input type="checkbox"/> Co-ordination and monitoring of training <input type="checkbox"/> Evaluation of training <input type="checkbox"/> Liaison with other organisations and authorities <input type="checkbox"/> Expansion of training <input type="checkbox"/> Research and development of improved training
TRAINERS	<input type="checkbox"/> Preparation and running of training sessions <input type="checkbox"/> Travel in connection with training <input type="checkbox"/> Preparation of training material and revision when necessary <input type="checkbox"/> Liaison with consultants and experts <input type="checkbox"/> Field monitoring exercises <input type="checkbox"/> Administrative work in connection with training <input type="checkbox"/> Research and development of improved methods <input type="checkbox"/> Receiving instructional training (training of trainers)
SUPPORT SERVICES	<input type="checkbox"/> Secretarial assistance <input type="checkbox"/> Drivers <input type="checkbox"/> Vehicles
TRAINING MATERIAL	<input type="checkbox"/> Typing <input type="checkbox"/> Artwork <input type="checkbox"/> Printing and binding <input type="checkbox"/> Modification or translation <input type="checkbox"/> Distribution
PREMISES	<input type="checkbox"/> Office accommodation <input type="checkbox"/> Training premises
EQUIPMENT	<input type="checkbox"/> Flip-charts <input type="checkbox"/> Audio-visual equipment <input type="checkbox"/> Overhead projectors
PARTICIPANTS	<input type="checkbox"/> Invitations <input type="checkbox"/> Accommodation <input type="checkbox"/> Subsistence <input type="checkbox"/> Transportation
EXPERTS AND CONSULTANTS	<input type="checkbox"/> Preparation and contribution during training sessions <input type="checkbox"/> On-the-job assistance to participants <input type="checkbox"/> Assistance with preparation and evaluation of training material <input type="checkbox"/> Travel

IMPROVED PERFORMANCE

The purpose of any training programme must be an improvement in performance among the target group. The improvement should start shortly after the participants have begun to apply the acquired skills, and will continue over a period of time as the skills are practised. The pattern of improvement, or learning curve, will depend on the nature of the skill. It is likely, for example, that a training

programme in estimating and tendering will lead to an improved performance more rapidly than a programme on financial strategy.

Improved performance should not be seen as relating just to specific construction management skills, such as planning, estimating, site management, safety, contract procedures, and so on. A contractor's conduct of the business as a whole is also an important area for improvement. This would include investment policy, exploration of new areas and development of business strategy.

TRAINING AS AN INVESTMENT

Measuring the cost of training inputs is relatively easy. Measuring training benefits is more difficult, and sometimes controversial. But the effort is worth making, because training expenditure is an investment and should show an appropriate financial return in terms of a ratio of benefit achieved to cost incurred. For example, if a training programme costs NU15,000 but yields a benefit of NU30,000, the benefit/cost ratio would be 2.

The reader may object that the idea of a benefit/cost ratio is somewhat theoretical, and it is appreciated that its calculation must be based on estimates and assumptions. Indeed, placing a cash value on the average performance improvement per participant is fraught with difficulty, and sometimes may be little more than a "guesstimate". For example, if the objective is to reduce the accident rate, then the comparison is not easy to make. On the one hand, the cost to the contractor of an accident may be limited disruption to site work and compensation to the employee, but for the individual concerned (and from the wider national point of view), the real cost of an accident can be catastrophic.

Nevertheless, we believe that the idea of a benefit/cost ratio is valid, even if it only helps the trainer to focus on the fact that training, like any other business activity, should show maximum results for minimum cost. It also encourages the trainer to seek ways of cutting costs while maintaining effectiveness, by thinking up a better way of presenting the material. For example, a proposed classroom training methodology may require two trainers. By improving the methodology, the number of trainers

may be reduced to one, but the same performance improvement among the participants may still be achieved.

The total benefit of a training programme (B) can be expressed as —

$$B = Pip \times No.$$

where

Pip = average performance improvement per participant,

$No.$ = number of participants.

THE BENEFIT/COST RATIO

If C = cost of resources put into the training, it is obvious that the training is only worth while if the benefit (B) is more than the cost of resources required (C).

We hope that you will never be involved in training exercises where the cost is greater than the benefit, but you will find it useful to compare the effectiveness of alternative training opportunities. The easiest way to do this is by dividing the benefit by the cost to arrive at a benefit/cost ratio:

$$\text{i.e. benefit/cost ratio} = \frac{B}{C} = \frac{Pip \times No.}{C}$$

example: calculating the benefit/cost ratio

A group of 15 contractors is trained in how to —

- increase site productivity;
- reduce overhead costs.

Following the training, monitoring exercises are run and it turns out that on average each contractor expects to save —

- NU5,000 due to increased productivity;
- NU3,000 due to reduced overhead costs;
- or a total of NU8,000.

Hence the total benefit as a result of the training is $NU8,000 \times 15 = NU120,000$. The training comprises six courses and workshops over six months, costing a total of $NU20,000$. The benefit/cost ratio is thus —

$$\frac{120,000}{20,000} = 6$$

IMPROVING THE BENEFIT/COST RATIO

As with any other form of investment, there are just two ways to achieve a maximum return. One is to cut the cost. The other is to increase the benefit.

The effective training manager will regularly review the mix of resources, and seek ways in which they can be deployed more effectively. Some advice on how to improve the training benefit/cost ratio through an effective use of resources is contained in table 3.

Although costs can sometimes be cut, perhaps by shortening the programme or reducing reliance on outside specialists, drastic cost cutting can be counter-productive if it reduces the quality of the training. So it is usually better

Table 3. Improving the training benefit/cost ratio

Category	Function
MANAGEMENT	<ul style="list-style-type: none"><input type="checkbox"/> Understands and appreciates the requirements, methods and benefits of training based on results. This is imperative if the training is to be effectively initiated, co-ordinated, evaluated and promoted<input type="checkbox"/> Provides good leadership, i.e. motivating and mobilising the available human resources in terms of trainers and support staff
TRAINERS	<ul style="list-style-type: none"><input type="checkbox"/> The capacity of trainers is crucial. They must appreciate that they are there to facilitate a measurable performance improvement, not to teach for teaching's sake. In order for them to do this job properly, they need a conducive environment where they can employ their innovative and creative abilities. They should not be burdened with routine administrative work
SUPPORT SERVICES	<ul style="list-style-type: none"><input type="checkbox"/> A few enthusiastic support staff of high quality can make the training team much more effective
TRAINING MATERIAL	<ul style="list-style-type: none"><input type="checkbox"/> A balance must be struck between quality and cost. There is no need for expensive colour pictures if black-and-white sketches are equally effective. On the other hand, it is bad practice to use mediocre sketches if good drawings can be done reasonably cheaply
EQUIPMENT	<ul style="list-style-type: none"><input type="checkbox"/> The equipment must be cost-effective. A flip-chart is cheap to purchase, and is an effective training tool. A video is relatively expensive and may need a lot of extra investment before it can justify the expense
EXTERNAL EXPERTS AND CONSULTANTS	<ul style="list-style-type: none"><input type="checkbox"/> The keyword is selection. Their ability to improve performance must justify their fee

to devote thought and effort to maximising the benefit. This again can be done in two ways —

- improving Pip (performance improvement per participant) by making the training more relevant;
- increasing the number of participants and spreading the benefits more widely.

Both these approaches are valid for the quality-conscious trainer. The second does not necessarily imply increasing the number of participants per course. Major savings can be achieved by developing standard courses which can be run regularly, and thereby spreading the heavy costs of preparing training materials over a much larger number of beneficiaries. One aspect of good management is a capacity for effective, detailed management of resources. Table 3 consists of a checklist which is intended to provide some guidance in the battle to reduce costs and provide a better service.

ECONOMIC BENEFITS

The direct benefits enjoyed by the contractors who participate in a programme can be described as financial benefits. However, it is not only the participating enterprises who derive benefits from contractor training, but also the clients, financial institutions and, if seen in a development perspective, the society as a whole. These can be described as the economic benefits of a contractor training programme. Some of these beneficiaries of contractor training are set out in table 4, together with notes on the benefits they can enjoy as a result of improved contractor performance.

evaluation

Evaluating training means monitoring to see if the objectives are being or have been achieved. It can (and should) be done at different levels and in different ways. Some useful types of evaluation are —

- continuous evaluation;
- course evaluation;
- evaluation against objectives;

- evaluating for promotion;
- evaluating long-term results.

Table 4. Beneficiaries of improved contractor performance

Beneficiary	Benefit
CONTRACTING FIRMS	<input type="checkbox"/> Improved financial health <input type="checkbox"/> Increased competitiveness <input type="checkbox"/> Improved reputation <input type="checkbox"/> Expansion possibilities <input type="checkbox"/> Better working conditions
FINANCIAL INSTITUTIONS	<input type="checkbox"/> Reduced delays in repayments <input type="checkbox"/> Reduced losses <input type="checkbox"/> Larger number of trustworthy borrowers
CLIENTS AND INDUSTRY	<input type="checkbox"/> Cheaper construction services <input type="checkbox"/> Fewer contractual disputes <input type="checkbox"/> Less risk of contractor not being able to complete the job <input type="checkbox"/> Better quality of the finished product <input type="checkbox"/> More projects completed on time
SOCIETY AND GOVERNMENT	<input type="checkbox"/> Construction of buildings and infrastructure in accordance with time, cost and quality targets <input type="checkbox"/> Wider choice of services in construction <input type="checkbox"/> Cheaper construction services <input type="checkbox"/> Better durability and safety of buildings and infrastructure

CONTINUOUS EVALUATION

This is primarily an attitude of mind and should be carried out by both trainers and training managers. It means simply having the habit of asking oneself and one's organisation questions like —

- Are we being cost-effective?
- Will we, if we carry on this way, achieve the objectives?
- Are the participants improving their performance?
- Is there any way we can improve?

Continuous evaluation is a process of self-examination which is performed by any successful company or individual. Training requires this no less than any profit-making business.

COURSE EVALUATION

Training sessions should be evaluated by both trainers and participants. This is done for two reasons —

- to measure the usefulness of the session;
- to improve future sessions.

The skilled and sensitive trainer will of course obtain useful information about the participants' reactions simply by watching them and listening to their conversation. However, these broad impressions should be supplemented by the use of rating scales on which the participants indicate their reactions to a particular aspect of the session. Examples of aspects are usefulness for their work, the suitability of the training method and practical arrangements. For example, a rating scale may look like this —

I have found this session:

very well presented	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; height: 20px; text-align: center;">1</td> <td style="width: 20px; height: 20px; text-align: center;">2</td> <td style="width: 20px; height: 20px; text-align: center;">3</td> <td style="width: 20px; height: 20px; text-align: center;">4</td> <td style="width: 20px; height: 20px; text-align: center;">5</td> <td style="width: 20px; height: 20px; text-align: center;">6</td> <td style="width: 20px; height: 20px; text-align: center;">7</td> </tr> </table>	1	2	3	4	5	6	7	very badly presented
1	2	3	4	5	6	7			
very stimulating	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; height: 20px; text-align: center;">1</td> <td style="width: 20px; height: 20px; text-align: center;">2</td> <td style="width: 20px; height: 20px; text-align: center;">3</td> <td style="width: 20px; height: 20px; text-align: center;">4</td> <td style="width: 20px; height: 20px; text-align: center;">5</td> <td style="width: 20px; height: 20px; text-align: center;">6</td> <td style="width: 20px; height: 20px; text-align: center;">7</td> </tr> </table>	1	2	3	4	5	6	7	totally unstimulating
1	2	3	4	5	6	7			

For me in my present job, the session has been:

extremely useful	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; height: 20px; text-align: center;">1</td> <td style="width: 20px; height: 20px; text-align: center;">2</td> <td style="width: 20px; height: 20px; text-align: center;">3</td> <td style="width: 20px; height: 20px; text-align: center;">4</td> <td style="width: 20px; height: 20px; text-align: center;">5</td> <td style="width: 20px; height: 20px; text-align: center;">6</td> <td style="width: 20px; height: 20px; text-align: center;">7</td> </tr> </table>	1	2	3	4	5	6	7	totally useless
1	2	3	4	5	6	7			

The aspects of the course which should be assessed by the participants are —

- how it will help them improve performance;
- whether the course met their expectations (if not, why not);
- the level of subject treatment;
- the duration of the course;
- the pace of the course;
- the training methodology;
- literature provided on the course;
- site visits;
- administration of the course;
- accommodation and catering;
- who else in their organisations should be offered such a course;
- suggestions as to topics which should be introduced or extended and topics which should be excluded or reduced.

Additional and more detailed questions can be asked on specific topics which have been dealt with during the

course, if the trainer is seeking to improve the content of those topics at future courses.

EVALUATION AGAINST OBJECTIVES

There are three reasons for this form of evaluation —

- the immediate results of the training are assessed;
- the training can be analysed with a view to improvement;
- the results from the evaluation can be used for the promotion of further programmes.

How is the evaluation done? This depends largely on the number of participating contracting companies. If there are only a few of them, each can be assessed. Depending on the exact objective of the training, such matters as reduced cost or time overruns, more precise tendering and increased quality of work can be assessed for each of them. A classification can then be made of those who have achieved the objective and those who have not. The percentage of those who have succeeded determines the degree to which the objective has been achieved.

For example, the objective of a programme in project planning is to reduce by 50 per cent time overruns on projects executed by a group of 15 contractors. The first contract executed by each contractor is monitored. It is found that compared to previous contracts the time overrun is reduced by an average of 40 per cent. In this case an evaluation against the objective would conclude that it has been achieved at 80 per cent ($40/50 \times 100$ per cent = 80 per cent). It is not likely to be an exact measure, but it gives an indication of the extent to which the objective has been achieved.

In the case of more extensive programmes, such as when a big national training programme is launched, the number of participants is too high for everyone to be assessed individually. In that case it is best to select a limited number of contractors who are likely to be representative of the whole group and then assess their performance improvement.

EVALUATING FOR PROMOTION

Contractor training agencies often find it difficult to promote their training programmes. The difficulties arise at

two levels: contractors are sceptical of the usefulness of the programmes and decision-makers may consider the issue to be of minor importance or too complex to tackle.

Results from the evaluation can overcome the scepticism of both levels if they are presented in the right way. This is similar to marketing a product. The most effective product advertising rests on hard facts presented in an interesting and stimulating way. Part of the reason for evaluation is to generate facts on the savings that contractors can generate by learning and applying better methods of running their businesses. A training course may seem expensive if the attendance fee is NUI00. But it will be cheap if the participant goes back to his business and generates savings of NUI,000.

EVALUATING LONG-TERM RESULTS

The main purpose of evaluating long-term results is not only to assess the long-term impact of the training but also to be able to show decision-makers and prospective financing agencies that well-designed and skilfully executed contractor training can have an impact at national level.

Long-term objectives serve as goals which, if reached, will ensure the satisfaction of the demand which led to the contractor training programme. Evaluating results against these objectives means assessing the extent to which this demand is being met.

If, for example, the contractor training originated from dissatisfied clients, a survey should be made to see if, as a result of improved contractor performance, more clients are satisfied with the services rendered by contractors. If, however, the demand arose from financial institutions because they lost money or loans to contractors, a survey should be made to see if they are losing less as a result of the training. Lastly, if the demand came from the contractors themselves, an assessment should be devised to measure how the financial state of their companies has improved.

PREPARING FOR THE TRAINING 3

training needs analysis

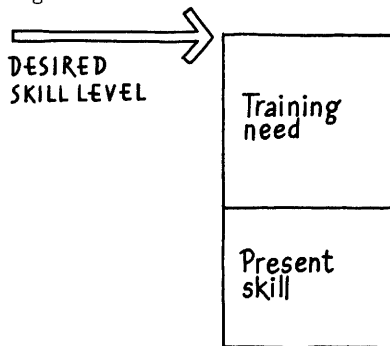
GENERAL

Analysing the training needs of a group of contractors means simply finding out what they need to learn. In order to achieve this, it is necessary to know two things —

- their *desired* skill level;
- their *present* skill level.

The difference between the present and the required skill level is the gap which the training should be designed to fill, as shown in figure 5.

Figure 5. Present and desired skill level (a)



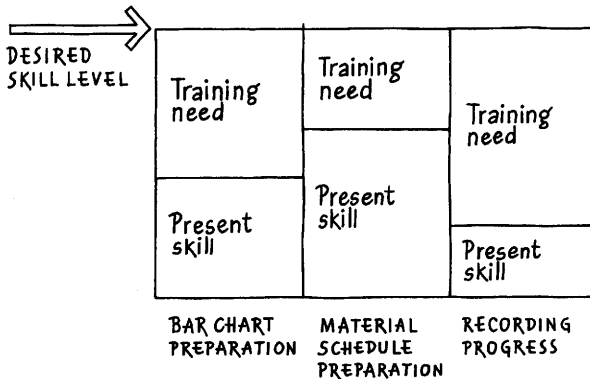
This is a general way of expressing training needs. However, each subject has a number of topics, each with a different gap between the desired and the present skill level. In project planning, for example, the picture may be as shown in figure 6.

Figures 5 and 6 may appear to state the obvious, but it is surprising how rarely trainers do basic market research on the needs of their clients. The result is that many courses start with high hopes, but end as missed opportunities.

A successful programme depends on an accurate training needs analysis. If contractors are subjected to training in skills which they already possess at a level sufficient for their needs, they will inevitably (and rightly) lose faith in the course. As far as they are concerned, they will have wasted valuable time which could have been better spent supervising their projects. Equally, if they receive only a little training on a vital topic they are again wasting their time because the opportunity to fill the real gap in their knowledge is lost.

To be useful, training needs analysis must produce detailed information on what is already known and what needs to be known. So it is necessary not only to find out which skills the contractors need to improve but also the characteristics of these skills. For example, training needs analysis may identify that a group of contractors need to improve their skill in drawing bar charts to plan and control their site activities. This is quite satisfactory as a broad identification, but it will also be necessary to decide on the method for drawing a bar chart which will suit them best.

Figure 6. Present and desired skill level (b)



DESIRED SKILL LEVEL

The trainer may know, based on personal knowledge of the group of contractors concerned, how well they should be able to perform a certain skill, for example, that they should be able to draw an effective and realistic bar chart for any kind of project they are likely to undertake. The experienced trainer may also know which method would be best for them to use. This way of stating the desired performance level is recommended only for those trainers

who, on account of sufficient practical experience and knowledge of local conditions, know exactly how well the contractors should be able to perform the various skills.

Another way is to examine the level at which successful contractors practise their skill. This gives a good picture not only of their performance but also of the relative importance they give to the various parts of the skill. The information is best obtained through interviews and by looking at samples of their work. When using this approach, a number of contractors should be approached, rather than just a few, because it is likely that the way they practise the skill varies from one enterprise to another.

The desired skill level must be specified in detail. It is not sufficient to state that following the training the contractors should be able to, say, plan their projects properly. For a planning skill, for example, it is necessary to identify the desired performance level with regard to timing and duration (of project activities), labour input, materials requirements, and so on. The desired skill level is the standard which the trainer will use for deciding on the exact content of the course. Therefore, it is worth taking time and trouble to determine the desired performance level so that the training will accurately reflect the need of the participants.

example: calculating the quantities
of materials needed

The format shown in figure 7 was used to interview successful contractors in Kenya in order to assess the desired skill level for calculating the quantities of materials needed. This was one of the skills included in a course on estimating and tendering.

Figure 7. Assessing the desired skill level (a)

WHAT THE CONTRACTOR MUST KNOW TO ESTIMATE	WHAT A CONTRACTOR SHOULD KNOW TO ESTIMATE WITH SUCCESS
CALCULATING THE QUANTITY OF MATERIALS	

One of the successful contractors who was interviewed gave the answers shown in figure 8.

Figure 8. Assessing the desired skill level (b)

	WHAT THE CONTRACTOR MUST KNOW TO ESTIMATE	WHAT A CONTRACTOR SHOULD KNOW TO ESTIMATE WITH SUCCESS
CALCULATING THE QUANTITY OF MATERIALS	<input type="checkbox"/> The amounts of different types of materials needed <input type="checkbox"/> Wastage <input type="checkbox"/> Availability	<input type="checkbox"/> The exact amount needed <input type="checkbox"/> The exact quality of the materials

It is worth noting that the question refers to calculating the quantity of materials of various kinds. The mention of wastage is important, since wastage means that the contractor has to buy more materials than he will eventually be paid for on the basis of the bill of quantities measurements, and the price he will charge must allow for that. Availability could be important, if the contractor is likely to be forced to substitute a higher-quality (and more expensive) product for that specified. Certainly the contractor should know both quantity and quality as exactly as possible in order to set out a realistic unit price.

The calculation of the quantity of materials needed was one of 24 estimating skills on which the group of successful contractors were interviewed. As could be expected, each question was answered rather differently by different contractors, but useful common conclusions could be derived from the interviews.

It is usually best to assess the desired skill level before attempting to measure the present performance level. The reason for this is that, once the trainer has determined what contractors should be able to do and how they should be able to do it, it is much easier to formulate the right questions to measure their present level of performance.

PRESENT SKILL LEVEL

An assessment of the present skill level implies finding out —

- what skills contractors practise now;
- how they practise the skills.

For example, before running a course on productivity and site management you want to explore the need for learning how to organise efficient site supervision. A quick survey will show that most contractors have an organised system

of site supervision. However, this will not be sufficient as a training needs analysis. For this purpose you need to find out how efficiently the site supervisor manages to co-ordinate the labour force and which faults or delays commonly occur as a result of inadequate supervision.

Finding out which skills are practised by contractors is easily done through interviews and site visits. It can even sometimes be done by sending out questionnaires, although this is generally less reliable than a personal visit and assessment.

The most important thing to find out is how the contractors practise the skills. This includes discovering both which methods they apply and how efficiently they apply them. The former is best investigated by conducting interviews with the contractors. In order to verify their statements as to which methods they use, it is preferable to obtain samples of their work. For example, when carrying out a training needs analysis for a course on bookkeeping it is helpful not only to ask contractors to describe the way they do their bookkeeping but also to review their books to see if they made correct use of the method.

Table 5. Determining how efficiently skills are practised

Source	Advantages	Disadvantages
Contractors	<input type="checkbox"/> They have detailed knowledge of their methods <input type="checkbox"/> They feel directly the effects of their shortcomings	<input type="checkbox"/> They may not be objective <input type="checkbox"/> They may not themselves know how well they should perform a certain skill
Consultants, engineers, etc., who work in the industry	<input type="checkbox"/> They are objective <input type="checkbox"/> They are able to judge professionally the general standard of the contractors' skills	<input type="checkbox"/> They may not know the contractor's situation in detail <input type="checkbox"/> They usually have a very different educational background from the contractors
Clients' supervisory staff	<input type="checkbox"/> They are able to judge the effects of the contractors' performance on the project	<input type="checkbox"/> They may not know the technical constraints of the contractor <input type="checkbox"/> They may not be technically competent to judge the contractors' performance as related to certain skills

A more difficult task is to find out how efficiently they practise a certain skill. Besides being the most difficult part of the needs analysis, it is also the most important information to obtain. There are basically three sources to

be tapped for this kind of qualitative information. These are listed in table 5 which gives the advantages and disadvantages of each source of information.

An analysis should ideally include information from all of the three groups listed in table 5. The two most essential groups who can provide information are the contractors themselves and consultants or engineers who work in the industry. The contractors must be approached in order to assess the way in which they perform a skill. They are also able to say why they do it in a particular way. Independent consultants or engineers are often in a better position to make an objective judgement of the general level of performance in certain skills. Resident engineers and clerks of works may be able to provide useful information on how specific projects are affected by weaknesses in the contractors' present performance.

example: training needs analysis for road
contractors in Ghana

Table 6. Training needs analysis for road contractors in Ghana

Purpose	Questions	Means of survey
To know the extent to which present practice overlaps with that for LB road works and to get an indication of contractors' background experience	Which parts of their work are equipment intensive and which are labour intensive, and how are these distributed over contracts?	Interview the contractors
To know which skills they practise or are familiar with now. To know which skills they think they will need to acquire for LB methods	Which parts of the skills do they practise now? Which do they think will need to be improved for LB methods?	Interview the contractors. Collect samples of their work
To obtain qualitative indications of their present practice and background experience	What is their level of performance relating to time, quality and finance?	Interview DFR staff or regional engineers
To obtain an objective, qualitative view of their skill level in the various areas	Which parts of their skills are satisfactory and which parts need improvement?	Interview DFR staff or regional engineers

Table 6 was used to carry out a needs analysis for road contractors in Ghana who were to be trained in the use of labour-based (LB) construction methods for the upgrading of feeder roads. Based on the table, a detailed questionnaire

was prepared for interviewing both contractors and the staff of the Department of Feeder Roads (DFR).

WHICH TOPICS?

There is a wide range of topics which are relevant for contractor training. Some of the most common areas where effective training can lead to dramatic improvements in performance are listed in table 7.

Table 7. Topics for contractor training

Area	Topic
TECHNICAL	<input type="checkbox"/> Estimating
	<input type="checkbox"/> Materials management
	<input type="checkbox"/> Planning and programming
	<input type="checkbox"/> Plant management
	<input type="checkbox"/> Site organisation
	<input type="checkbox"/> Tendering
	<input type="checkbox"/> Using computers
MANAGERIAL	<input type="checkbox"/> Company organisation
	<input type="checkbox"/> Long-term planning
	<input type="checkbox"/> Personnel management
FINANCIAL	<input type="checkbox"/> Bookkeeping
	<input type="checkbox"/> Budgeting
	<input type="checkbox"/> Cash flow analysis
	<input type="checkbox"/> Cost control
	<input type="checkbox"/> Purchasing

The division of topics under technical, managerial and financial headings is inevitably somewhat arbitrary, since the effective contractor finds that most tasks call upon a mix of technical, managerial and financial skills. The listing is by no means exclusive, and it is the trainer's task to assess local needs and local demand. Various mixes of topics may also be chosen according to target group. For instance, some of the topics may be suitable for owners and others for their staff, depending on the size of the firm. In small companies the owner will perform most of the functions mentioned above, whereas in bigger ones the functions will be divided.

SELECTING CONTRACTORS FOR THE ANALYSIS

In order to assemble representative data about the contractors to be trained, a number of interviews must be conducted. But before deciding on the sample size and whom to interview, the first step is to obtain a clear picture of the type and size of contractors whose skills are to be

upgraded through training. In most countries there is an immense difference in sophistication between the very small enterprises at the fringe of the market and the established large-scale contractors. In between these two extremes there are various layers of intermediate firms which each require management techniques suitable for their particular needs. For a training programme to be effective, it is necessary to select a group which is reasonably compatible. Which group of contractors to select depends on the objectives of the training programme. Is the objective to upgrade the large number of small contractors in rural areas to a minimum level? Is it to help the medium-size companies grow larger? Or is it to improve the efficiency of large local firms so that they can compete effectively with international contractors? The objectives should state which group of contractors is to be brought up to which level of performance. There are many options, each of which will have its own effect on the development of a country's contractors.

Once it is clear which group of contractors is to be developed through training, it will be possible to identify companies which are representative of this group. As always with statistical sampling, the more contractors are interviewed the better. However, this should not be at the expense of interview depth. In any event, budget and time constraints are bound to limit the extent of sampling.

When writing up a training needs analysis, it is often helpful to include mini case studies of individual contractors (their practices, problems and needs). It is important for the trainer to focus on contractors as individuals with individual problems and not just as an anonymous set of "participants". The mini case studies will add colour to the description, and help the trainer to understand what it is like to be one of the target group of contractors, facing individual problems.

If the person doing the needs analysis knows from experience that certain contractors are largely representative of the target group, it may be sufficient to interview only these contractors. However, there are always dangers in such subjective judgements, and it is worth while at least getting a second opinion. Where the trainer is not so familiar with the contractors and their needs, it is usually possible to obtain a reasonably clear picture, through other contractors, consultants, Ministry of

Works officials or others, on which contractors within a certain group are likely to be representative of the group as a whole. Selecting representative contractors means selecting contractors whose performance levels depict a cross-section of the target group.

USING THE DATA FROM THE SURVEY

The survey should reveal the nature of present practices and their effectiveness. As has been suggested above, the contractors themselves will have described in detail how they manage their activities and to some extent how successful these methods are in practice. Independent consultants, engineers, Ministry of Works staff, clients' supervisory staff, and so on, will offer a more objective assessment and should be able to provide qualitative indicators of the contractors' performance level. Providing that the training needs survey is reasonably satisfactory and that it accurately describes the nature and the quality of present practices, the trainer can now go on to use the data, and decide on the content and level of the training programme.

The methods which the contractors employ must be given considerable attention. An important question to ask is whether they are methods which have been developed through experience and which contractors consider to be effective in the light of their capabilities and the conditions under which they work. In that case, it is likely that the training will be more effective if it builds on contractors' existing methods, particularly if several different contractors have independently come to the same conclusions. If, on the other hand, the methods used by the contractors have not been developed consciously and do not seem to function productively, contractors are likely to benefit more from being trained in a new method which will serve their purpose better. In selecting or developing an alternative method, valuable information may be obtained from those contractors who are reputedly the group's best performers.

A qualitative survey is made by examining the level at which the different contractors practise their skills. It is likely that those at the lower end of the range practise most skills poorly and that the better performers generally cope reasonably well. The problem faced when selecting the

content of the training is that if it is too comprehensive, the good performers will become bored, and if only the most crucial skills are chosen, the lower-range contractors will benefit only to a limited extent. Keeping in mind that the aim of the training is to raise the performance level of the target group as a whole, the two following rules are useful for selecting the skills to be included in the training:

- select the skills which need to be improved by contractors over the whole range. There may be skills which most contractors lack;
- for skills whose level varies over the range, choose the shortcomings which are characteristic of the medium performers. This will benefit the largest number of participants.

programme design

DEFINITIONS

Training is a tool to provide a group of persons or companies with qualities which they do not currently possess. The qualities which are most important in contractor training are —

- KNOWLEDGE learning the necessary construction management techniques;
- SKILLS being able to perform those techniques;
- ATTITUDE appreciating the importance of learning the skills and knowledge and wanting to apply them.

Training is the process whereby these qualities are given to the participants. When the participants have been furnished with the right skills, their performance will improve as they make use of them in their work. A good training programme will continue to provide them with the necessary assistance so that they become able to use the skills to succeed as construction managers or contractors.

Remember that the measure of training is a change in behaviour. If the participants enjoy the course but then go back to their sites and carry on as before, the course is a failure. The test of a course on project planning is whether

the participants improve their performance in reaching time and cost targets. The test of a course on site safety is whether there are fewer accidents. This is why this book is entitled *Training contractors for results*.

TRAINING AND SELF-DEVELOPMENT

When designing a training programme, the trainer should remember that the programme is not just about the transfer of technical and/or managerial skills. A training programme can also provide a valuable forum for the self-development of the participants. Two areas in particular may be singled out, one which is business related and another which concerns the personal development of the trainees.

The business development aspect of training can be created by designing the programme in such a way that the participants analyse and act upon the environment within which they operate. This action can take various forms, such as exploring business opportunities among themselves or taking specific action to remove some of the practical constraints imposed on their development by clients or authorities.

In the area of personal development, training can be designed so that it offers opportunities for individuals to analyse and develop personal characteristics which will eventually make them better managers or entrepreneurs. The construction industry can place an enormous psychological strain on contractors, in the form of technical, organisational and business problems. One function of the training, therefore, may be to provide a forum to help them to analyse their strengths and weaknesses and to formulate their own personal development strategy.

STEP BY STEP

It has often been assumed that training a contractor — or any other manager — can be done by simply designing and implementing a single comprehensive course which will cover a full range of construction management skills. The idea has been to “teach” a skill over one or perhaps two weeks. It has then been assumed that this one-off approach will provide all the skills to enable the participant to succeed. Each participant is then counted as “trained”

without any attempt to measure whether performance improves when the participant returns to the working environment.

Unfortunately, this successful transformation rarely takes place. It is normally found that individual courses, if they are not combined with other activities, lead to a very marginal improvement or none at all.

Why don't one-off courses succeed in enabling participants to acquire and apply badly needed management skills? The answer is found in every one of us. We should examine our own professional lives for a moment, and think about the skills applied successfully in our daily work. Could they all have been learned at a single seminar at the beginning of the career? Probably not. The competence which most of us possess has been built up gradually through training (informal as well as formal), discussions with colleagues, self-analysis, advice from more experienced colleagues and trial and error of various methods. In short, it is a step-by-step process in which we accumulate learning over the years. A major feature is that the learning has been based on free selection. It was when we felt the need to learn a specific skill that we learnt it, either through seminars, advice, discussions or self-teaching. In this way the learning was tailored to our own individual development.

This is a natural way of learning. The implication is *not* that formal training is without value. The contrary is the case. But to be effective, the training must take account of, and reinforce, the natural learning process. The best training mirrors but speeds up the personal development which the participants would have achieved if the formal training had not taken place.

KEY CHARACTERISTICS OF TRAINING

From the above analogy we can extract certain key characteristics which determine the success of a contractor training programme —

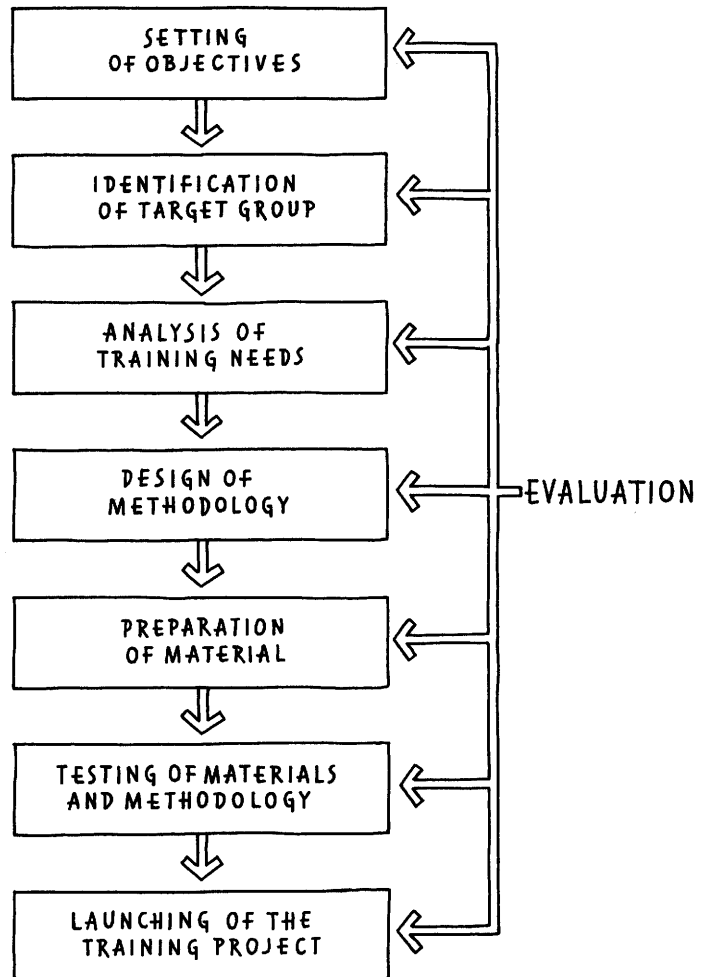
- the learning takes place over time;
- specific skills are learned when they are needed;
- the mode of learning is chosen which is the most effective at the time; therefore a selection of modes needs to be available;
- key elements are training, advice, interaction with peers and evaluation of performance.

TRAINING PROCEDURE

Designing an integrated training programme which successfully combines the above-mentioned key characteristics is the task of the training manager.

Certain steps in preparing and running a training programme apply not only to contractor training but also to training in general. Figure 9 shows a model of the procedure.

Figure 9. Steps in training procedure



DESCRIPTION OF EVENTS

setting objectives

This step was discussed in more detail in Chapter 2, "Setting objectives", and the reader will recall that the setting of objectives provides a formal statement of what is to be achieved. Objectives are formulated on the basis of the actual need for contractor training of the kind proposed. For example, if clients complain of poor quality workmanship, this will be one of the needs to be satisfied by the training. Demands from various other institutions and the contractors themselves will also determine the formulation of the objectives.

The objectives thus form a guide both to trainers and training management which helps them to work out an efficient training programme. In addition, they provide a standard against which the success of the training can be evaluated.

identification of target group

This step was also introduced in Chapter 2, "Setting objectives", and is clearly closely related to the setting of objectives. It is often helpful if the target group is identified at two levels —

- the companies which are to participate; and
- from within the companies, the people who are to participate.

For example, if the chief objective is to increase the competitiveness of the strongest local contractors vis--vis foreign contractors, a survey will be made to identify those local contractors with the greatest potential. Other specific target groups can be small contractors in rural (or urban) areas, contractors in the informal sector, contractors who undertake certain types of projects, contractors who are supported by a particular institution or contractors who are based in a particular area. All are legitimate target groups, but their needs are certain to be very different. There are too many examples of vaguely worded projects to train "contractors" without any clear idea of the potential participants or their needs. Such courses have given rise to the myth that contractors are "untrainable",

despite clear evidence of the substantial improvements achieved as a result of well-targeted, well-planned and well-implemented training.

analysis of training needs

The reader will recall that training needs were defined earlier in this chapter as the skills which the participants lack and need to learn in order to perform satisfactorily. They thus determine the content of the training material and the methodology to be used. These needs should usually be assessed through a survey supplemented by monitoring of current performance by the enterprises concerned.

Needs analysis is a crucial element of the training process. A thorough analysis which identifies exactly which skills the participants require in order to operate successfully lays the basis for an effective programme. A superficial analysis or a rough guess at what the participants need can render the training useless.

An assessment is made, not only of which skills are necessary but also of the likelihood that the participants will learn to apply them with success. For example, it may appear necessary to the trainer that the contractors should learn how to use the network analysis method in planning their projects. However, if an assessment is made of the amount of time and human resources which are needed to provide them with the skill, let alone to apply it in practice, it may well be that it is not worth including in the training.

design of methodology

This topic is discussed in some detail in Chapter 4, "Building a methodology", but the approach is introduced here as it is an important component of programme design. A methodology is planned at two levels —

- the programme: the order, duration and nature of various activities, such as courses, workshops, advisory services and follow-up sessions;
- the training sessions: the mode of learning; choice among lecturing, participative techniques, programmed learning, case studies, etc.

preparation of material

Learning material, case studies, exercises, lecture notes, trainers' guides, and so on, are written according to the methodology which has been decided upon. The writing should preferably be done on a team basis between training specialists and construction management experts and with advice from practising contractors. This is discussed in more detail in "Preparing the training material", below.

testing of materials and methodology

Whenever possible the raw training material should be tested and refined before it is used. It is a good idea to gather together a group of contractors upon whom the trainer can try out both the training materials and the methodology. The best choice are contractors who are a little better than the average among the target group, but not so knowledgeable as to fail to appreciate the problems faced by others and the need for simplification of relatively complicated ideas.

launching the training project

Based on the results from the testing and subsequent modifications, the main training project is launched (see Chapter 4). The project is likely to consist of a series of parallel programmes for different enterprises or for different categories of personnel.

evaluation

Evaluation takes place at all levels and stages of the training, during both the preparation and the running of the programme. For example, the evaluation of job performance some time after a training course can enable the training material to be steadily improved, because it gives an indication of which topics were most useful to the contractors. The inclusion of training in skills that are found to be too complex to apply or of marginal value is pointless, and such items should be dropped. On the other hand, training in skills that prove very useful to the contractors can be expanded.

The prime purpose of evaluation is to improve the effectiveness of training programmes. Evaluation can also lead to the promotion of further programmes by assessing the impact of current training and the potential benefit from additional programmes. Since training, like any other service, has to be marketed to its potential users, the results of the evaluation process can be incorporated into future course publicity.

PLANNING THE PARTICIPATION

As mentioned earlier in the guide, training may be designed for company staff as well as the owners of enterprises. The following categories of staff may be considered for training:

- site manager;
- engineer;
- foreman or supervisor;
- accountant;
- office staff.

There are basically two different ways of structuring the participation. One can be described as horizontal, and the other as vertical.

Horizontal participation involves people who hold similar positions in different enterprises. A typical example is a training programme in site management which is attended by site managers from various construction enterprises. The learning will in this case be directed towards the individual, who will be responsible for the application of skills back on the job. The horizontal participation model is used when training is run for large numbers of small-scale enterprises.

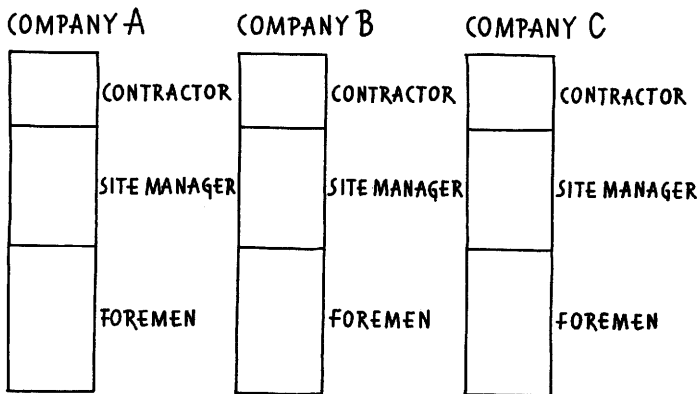
However, managers do not work in isolation, especially in larger enterprises. They usually depend on co-operation from people above them as well as below them. Take for example a site manager returning from a programme full of good ideas and a ready action plan to improve the efficiency on site. Neither the contractor nor the foremen who will be involved in the changes will have acquired the assumptions and techniques which the site manager acquired on the course. To them the justification of what he is trying to do will not be as obvious as it is to him. The support he needs to implement the changes may therefore be lacking, and the effects of the training will largely be lost

simply because the foremen did not go through the same learning process.

Especially where bigger companies are involved and where the training is expected to lead to a change of practice, training programmes necessitate the use of vertical participation models. In a vertical model, participants from different levels in the same company will be involved in the training. The purpose will not be to provide them with the same skills but to enable them to understand what their colleagues are learning and to appreciate the benefits for the enterprise. While the horizontal model is directed towards the individual, the vertical model is directed more towards the organisation. Whereas the outcome of a horizontally based programme may be individual action plans, the outcome of a vertically structured programme may be an action programme for the enterprise as a whole.

An example of a vertical model is shown in figure 10.

Figure 10. A vertical model for participation



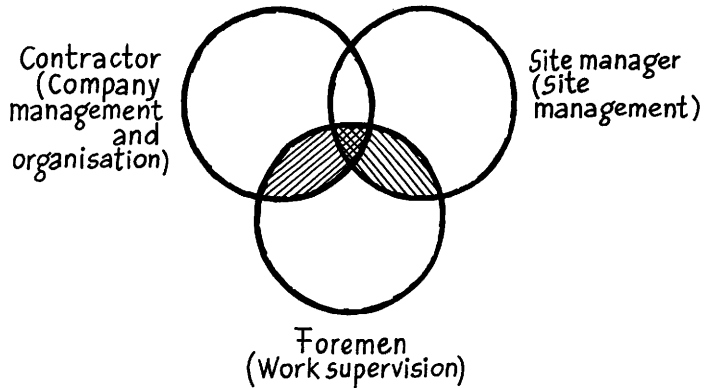
For the groups of people mentioned in figure 10, let us assume that their training methods are as follows:

- contractor — Company management and organisation;
- site manager — Site management;
- foremen — Work supervision.

The horizontal model would group all the contractors in one programme, the site managers in another and the foremen in another. They would all return from their programmes with different ideas of how their own performance should be improved.

The vertical model, on the other hand, would provide a certain overlap between the programmes in that different levels in the organisation would attend some of the training together. This is shown in figure 11.

Figure 11. Overlapping participation in training



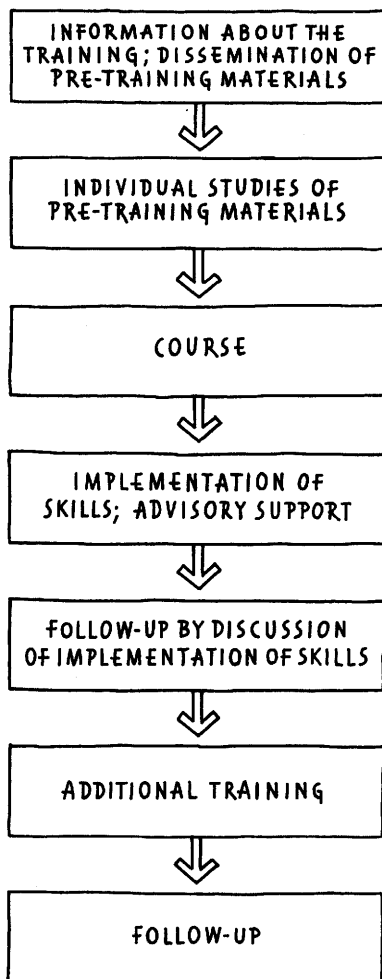
The overlapping parts of the programme should be designed to accommodate two kinds of activity. One is straightforward learning sessions where participants deal with the major points of their respective subject areas together. The objective of this activity would be to create understanding — to enable them to “speak the same language”. The other activity should be directed towards the specific problems of the enterprise. It could be run in the form of sessions where participants analyse together the situation of the enterprise in the light of what they have learnt during the programme, and formulate an action programme for the enterprise. The use of the vertical model would in this case help to ensure the involvement of the different levels in the organisation, which would again lead to a more smooth and effective implementation of the action programme than if individual action plans had been worked out.

Which model is most applicable depends largely on the characteristics of the target group. The vertical model is recommended for small numbers of larger enterprises. Where many small or medium-sized enterprises are involved, the vertical model requires too much in the way of time and human resources to make it cost-effective, and the horizontal model becomes the most suitable.

PROGRAMME STRUCTURE

A course or a seminar is not the same as a training programme, although it normally forms part of one. A good programme will contain additional complementary activities, such as the implementation of skills on the job, workshops on practical problems faced by the contractors, on-the-job assistance, and so on. A course may provide contractors with a management skill, but other job-related components of a programme enable them to improve their performance and gain confidence through applying that skill in their working environment. There are many ways of

Figure 12. Linking programme components



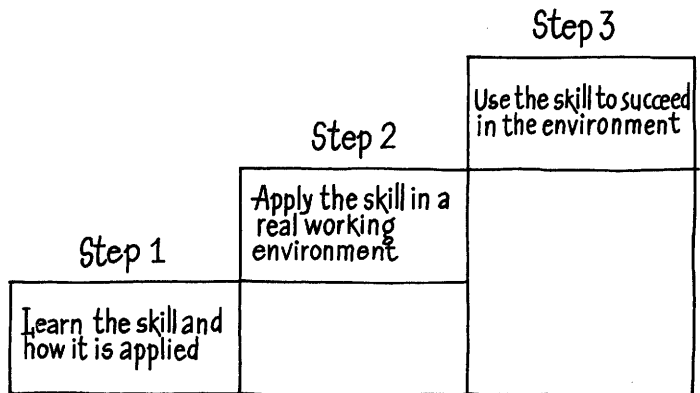
linking the various components of a programme. Figure 12 gives one example of how it can be done.

These elements are described in more detail in the chapters which follow.

WHY A PROGRAMME?

Substantial performance improvement cannot usually be satisfactorily achieved through a single seminar. As suggested in Chapter 2, there are three necessary steps in improving performance. We make no apology for repeating them in figure 13, as they are the basis for effective performance improvement through training.

Figure 13. Three steps to learning



Improving performance requires a series of activities which are designed to provide contractors with the necessary support and training as needed. At certain stages they may require further training, at others technical support and at others again they may need to discuss practical problems with fellow-participants in the programme.

Remember that learning a management skill has some features in common with learning how to read a foreign language. If you were just given a dictionary and left to your own devices, you would be likely to progress very slowly. If, on the other hand, you had the opportunity to seek help when needed and to find inspiration from others who were at the same stage, you would not only learn to read much sooner but would also learn how to read in an effective way. Thus we use the word "programme" to indicate the need

for a comprehensive and integrated approach to the learning process.

THE INGREDIENTS OF A PROGRAMME

Thus a programme consists of an integrated series of activities. The most commonly used activities in a programme are dealt with in more detail in Chapter 4, but are briefly summarised below.

courses

Participants learn a predetermined mix of skills and how they are applied. At the end of the course it is also useful for them to work out a plan of action outlining how they intend to make use of the skills.

on-the-job implementation

Participants apply the skills in their work. They may receive on-the-job assistance, either from other contractors or consultants who collaborate with the programme.

follow-up sessions

Participants present the way in which they applied the skills, what (if any) results they achieved and problems arising from the application. If necessary they receive further training. At the follow-up sessions they are able to learn how to use the skills with success.

workshops

These provide the participants with an opportunity to discuss practical problems which they have in common. The problems may or may not be directly related to the training, but are constraints which hinder their development.

COMPOSING THE PROGRAMME

A programme can be composed in many different ways, depending on a variety of factors such as the nature of the skills to be learned, the number of contractors to be

trained, and the amount of money and time available. It is not possible to give any hard and fast rules on programme design; it rests with the ingenuity and creativity of the trainer to compose a programme which is effective. An example of a programme design from Kenya is given below in the form of a case study. We hope that this will give the reader a view of how programme design can work out in practice.

programme design example:

the Kenya Site Productivity Programme

This programme was carried out jointly by the National Construction Corporation (NCC) and the ILO between May and December of the same year. When the contractors were first approached, the omens were not auspicious. The contractors were experiencing great difficulties in obtaining work, finance and equipment. The lack of access to training did not seem to worry them, and the improvement of their site productivity skills was well down their list of expressed priorities. But the NCC, clients, bankers and others in a position to take an objective view confirmed that many of the more obvious problems could be traced back to poor productivity leading to high costs and inadequate returns.

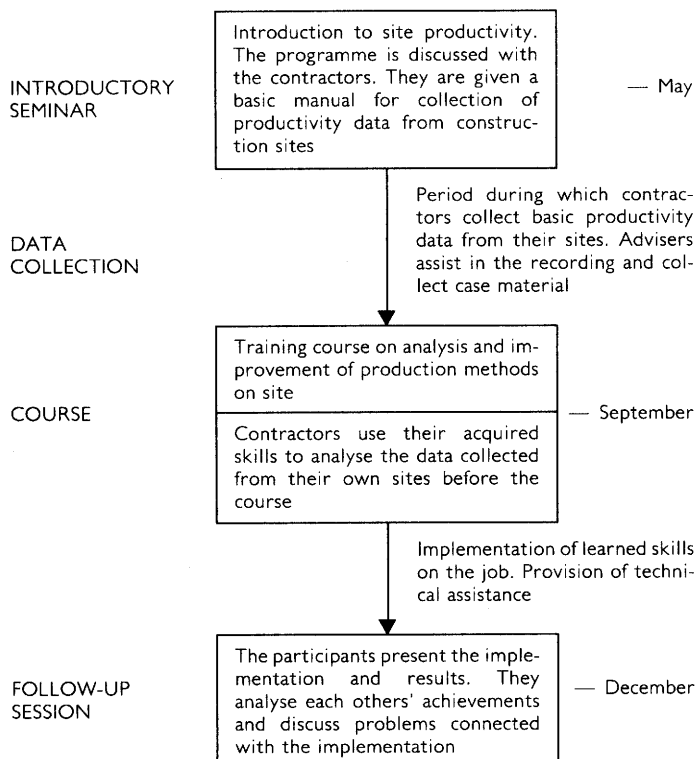
The selection of participants was made with great care. It was important to select contractors who had a relatively open mind to training and who were likely to apply the skills when back on site. In turn this meant that the programme itself had to be demonstrably relevant, so as to attract contractors with a serious interest in self-improvement. This faced the organisers with a conundrum.

Since this was the first site productivity course in Kenya, there were no prior success stories to convince the participants of the relevance of the method. It was therefore decided to "seed" the programme with two people who had experimented with the method and who could give recommendations. The first was the manager of the NCC training department who had been recording productivity data from several sites and who later told the participants that while he had at first been sceptical, he now appreciated that work study was useful. He illustrated his points by describing sites he had visited recently where the

methods had helped him suggest improvements. His experience was supported by an NCC site manager in charge of a large project that had been abandoned by a private contractor and was being "salvaged" by NCC.

In view of the tentative nature of the programme, it was decided that the chosen participants should themselves contribute to its design. Accordingly, meetings were held in May and June at which productivity issues were discussed, in particular what problems the contractors had on their sites and how they could be solved. The participants appreciated being consulted before the programme was drawn up. As one of them said, "I feel that I take part in determining the content of the training. Therefore I feel confident that the training will be tailored to my needs." The contractors were provided with a simple manual for collecting productivity data from their sites and shown how to use it. The result was that it was agreed that everyone should work to the eight-month programme outlined in figure 14.

Figure 14. The Kenya Site Productivity Programme: Outline chart



Between the meetings and the course, productivity data were collected from participants' sites by the contractors, assisted by NCC advisers. The data concerned site layout, activity level on the site, bottle-necks, daily output and construction methods being used.

In September a course on site productivity was run. It was divided into four units aimed at the analysis and improvement of the efficiency of site operations. Each unit contained a learning text, a quiz, a main training case, smaller cases and exercises. A participative training methodology was used, which turned out to be appropriate, because it enabled the participants to learn from each other. Less than 10 per cent of the time was spent on lectures, which were used only to introduce a topic or to explain difficult parts of the learning material.

The training went well. Quizzes were given at the end of each unit and it was found that the participants scored an average of 90 per cent each time. The content was about right. Several times a contractor remarked: "This is just what we need."

Following the learning part of the course, two sessions were run during which the participants used what they had learned to analyse the data recorded from their own sites before the course. Based on the analysis, they suggested how the recorded operations could be improved. This enabled them to relate the subject to their own situation and showed them how to apply the skill on site.

After the course the participants were given a reporting form for post-course implementation of skills. By filling in the form they described how they applied the skills to analyse and improve certain aspects of their site operations, and how the improvements affected the project. They were also asked to draw up site layouts and programmes and show the calculations which they used. In doing this they received some assistance from NCC advisers.

In December a follow-up session was held to enable the participating contractors to discuss what they had done to improve productivity on their building sites and to allow the trainers to assess the impact of the programme which had started in May. Of the 12 contractors who attended, seven had ongoing jobs where they could measure and improve site productivity. Six of these reported on their post-course work.

The session was started by dividing the participants into six groups; one for each contractor who had prepared a report. Each group was then asked to analyse the report, question the contractor and suggest alternative ways he could have improved productivity. A spokesman for each group then presented its findings for discussion in a plenary session.

Discussions were lively. Some contractors had improved site productivity much more than others, and gained the respect of their peers for their professional achievements. All six had tried new methods. Some had changed their wage systems by introducing piece-work or bonuses for meeting targets; some had rearranged site layouts; others had improved site supervision or materials handling; and still others had improved the balance of work among their work gangs.

One contractor, for example, who was constructing facilities in a game park discovered, using the work study techniques he had learned, that his site activity was only 15 per cent of what it could be. Because his sites were widely scattered he had to make some difficult trade-offs among the storage of equipment and materials, transport and security. By accommodating his workers closer to the sites he cut his transport costs by half; by improving supervision he improved productivity and reduced pilferage. He made the conservative estimate that these measures improved production by 20 per cent (i.e. a saving of US\$30,000 on one job alone).

Six contractors improved productivity in block laying between 20 and 50 per cent by introducing piece-work or task rates and by paying workers weekly rather than monthly. Two contractors, for example, had introduced bonuses so that masons were producing about 50 per cent more while earning about 30 per cent more. Wastage, pilferage and breakage were cut by 30-60 per cent.

It was generally agreed that the contractors had saved many times the cost of the programme on their current jobs and that these improved methods would be applied on future contracts. It is also important to note that lower unit costs are reflected in more competitive bids so that some of the savings will be passed on to clients through future tenders.

marketing the course

Careful preparation is one of the keys to successful training. This and the next section of the guide cover marketing the course and preparing the participants for the training. Preparing for a course also involves other ancillary activities, such as arranging accommodation and transport, the setting up of audio-visual equipment, the acquisition of stationery, administrative support, and so on. These are not dealt with in this guide, which concentrates on training methodology rather than administrative arrangements of this kind.

THE KEY TO MARKETING

A training programme is a service, and services — like products — rarely sell themselves, particularly in the early stages. So attention must be paid to —

- the quality of the product; and
- how it is marketed.

The key to marketing is an understanding of the needs and demands of the potential customers. This should never be taken for granted. For example, a trainer may be convinced that a training course is well conceived and relevant to the needs of a chosen target group. However, the prospective participants may not know the course exists or, if they do know, may not be attracted by the course outline. Marketing a training course means identifying target participants and convincing them that attendance will be a good investment of their time and money. This is where client orientation and the selection of keen participants becomes important.

PICKING WINNERS

Although new courses require marketing efforts, courses run by respected institutions and trainers offering an established product should sell themselves. The aim should be to reach this stage as quickly as possible, by steadily building a reputation for competence and good results. Before the reputation is achieved, however, the programme is weak and vulnerable. This is a stage where

it is important to generate a feeling among the contractors that the course is likely to prove a good investment.

Success breeds success, and one of the strongest motivating forces for a contractor to improve performance is a desire to emulate successes already achieved by contemporaries. If a potential participant could find the reason why other contractors succeed, course attendance would be well worth while. For example, if a contractor greatly improves bidding skills as a result of a training course and wins an attractive contract as a result, this will certainly encourage others to sign up for future courses.

Demonstrable success in the early stages is vital. A competent training manager will realise that he can multiply the chances of success by inviting potential "winners" to the first courses. The criteria for selecting these participants will be that —

- they have a promising future as contractors;
- they have a positive attitude to training.

Because these contractors have a record and reputation as successful entrepreneurs, they will be strongly motivated to benefit from the course. In turn, providing they are convinced that they have benefited, they will speak favourably of the experience and they will be *listened to* as a result of their reputation. If this happens, future marketing will be taken care of, free of charge.

WHO SHOULD ATTEND?

In this guide the term "training of contractors" is often used. It does not necessarily mean that the proprietors of the contracting firms should attend in person. Training courses should be run for the people in the company who will actually be in a position to make use of the acquired skill. In small firms the contractor generally undertakes all the management functions, such as purchasing materials, preparing the accounts, directing the labour force, and so on. In such cases the training should be directed at the owner. However, once an enterprise begins to grow certain managerial responsibilities have to be delegated. Then it is best to target the training on a particular skill or skills required by individuals, such as layout and site supervision for the site foreman or site manager. Some training programmes can be designed in such a way that the

owners or senior managers attend an initial appreciation session on the principles of a skill and those responsible in the firm then receive detailed training in its application. This is advantageous where major changes in procedures or techniques will have to be implemented in order to secure performance improvements.

INVITATIONS

All participants should receive an invitation to attend and a programme of activities at least three weeks before the course is due to start (and preferably even further ahead). This gives them time to make arrangements to ensure that their sites run smoothly while they are attending the course. It may also give them a chance to reschedule meetings which require their personal attendance.

The course programme should not be too detailed. However, it should set out the time, place and content of sessions clearly and concisely. While excessive detail is unnecessary, sufficient descriptive and background material should be included to make the course appear interesting and worth while. The programme should be clearly written and attractively laid out, so that it presents a professional appearance. If contractors have a clear picture of the content of the course, they are able to relate it to their own jobs and think about which skills they need to improve before attending.

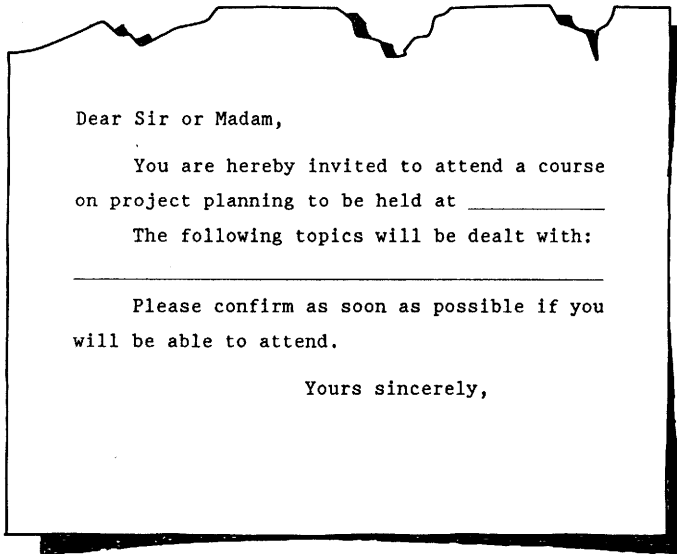
The trainer must always bear in mind that contractors will not attend a training course for its own sake. For them, it is an investment of time to learn a skill which will help improve their businesses. This should be remembered when writing the invitation. It is not just a descriptive letter; it should also be a selling document, since it provides the basic data and evidence upon which the contractor will decide whether or not to attend. So it has to be clear from the invitation that the course will improve the contractor's business.

example: a course invitation

The invitation shown in figure 15 might succeed in getting contractors to attend, but it is not very persuasive.

The invitation shown in figure 16 stands a much better chance of attracting and motivating participants. It

Figure 15. A course invitation (a)



addresses the prospective participant by name, and goes on to imply that the writer is genuinely interested in helping to solve the participants' problems.

The invitation should in addition contain practical information about matters like accommodation, course fee, and so on.

MEETING THE CONTRACTORS

A very good way of motivating the participants in advance is to visit them individually to discuss problems related to the skill to be covered by the course. This skill usually represents one of the problems faced by contractors, so it is likely that they will be eager to discuss its effects and how training could help. Meeting the contractors face to face also has an advantage over a written invitation in that the purpose of the course can be clearly explained and any misconceptions can be cleared up. A busy contractor may not always take the time to read an invitation thoroughly.

Instead of visiting the target group of contractors individually, a meeting can be arranged to which they are invited. This gives them a chance to discuss matters relating to the course, and is not so time-consuming for the organiser as a series of individual appointments. Where there is already a contractors' association in existence, it may be convenient to arrange a special meeting of the

Figure 16. A course invitation (b)

Dear _____

I have pleasure in inviting you to attend a course on project planning for building contractors, to be held at _____ (place) from (date) _____ to _____ (date).

The daily sessions will start at _____ (time) and finish at _____ (time).

The course, which uses advanced training techniques, and emphasises involvement by the participants, has been especially prepared for the contractors in _____. Following the course you will have improved your skill in -

- preparing time- and cost-saving project plans;
- preparing materials schedules which help ensure that the right amount of materials arrive at the right time;
- preparing short-term programmes to help your site supervisor to get the best results from your labour force.

The topics to be dealt with at the course are as follows:

Please confirm as soon as possible if you will be able to attend as the number of places available is strictly limited.

Yours sincerely,

association or to discuss the proposed course as an agenda item of a regular meeting.

MOTIVATING THE PARTICIPANTS

People only learn what they want to learn or need to learn. In other words, motivation is a prerequisite to success in training. Why are you reading this guide? You are reading it presumably not out of idle curiosity but because you want — or need — to know how to run training for building contractors. This motivates you to understand and remember the contents of the guide. If you did not intend

to train contractors, how much attention would you then pay to the guide, and how much would you be likely to learn from it? The same principle applies to the participants at your course. If they are motivated to attend the course and get something out of it, their learning performance will be much better than if they are simply there because someone has told them to attend.

Motivation can be built up during a course. For example, after some early sessions during which they work through the material, solving interesting exercises and discussing the topic with other contractors, the participants are likely to appreciate more fully the potential benefits that can be gained from the course. But if the course is slow to gain momentum, half of the course time may be lost before they have worked up sufficient enthusiasm to learn efficiently.

It is best to prepare the participants for the course soon after they have been selected, and well before the course begins. They will then be eager to learn right from the start. In addition, this gives them an opportunity to think constructively about the topic in their everyday work situation, on site or in the office. During the last few weeks before attending a planning course, for example, they may think through the various steps in their own planning process, how effective their programmes are and ways of improving them.

PUBLICISING RESULTS

If the course has been run on several previous occasions and if some contractors have achieved significant improvements as a result, it is worth including information about this in the invitation. Contractors in many areas are reluctant to attend training courses because they think, often justifiably on the basis of previous poor experience, that the training will not help them improve their businesses. However, if there is evidence that other contractors have already benefited from attending a similar course, this is a powerful argument for them to attend and take full advantage of it. An appropriate paragraph in the invitation could be, for example —

24 contractors in the District have already greatly improved their planning skills as a result of a similar course, which has enabled them to save money through more efficient execution of their projects.

Or even better —

Mr. of Construction Ltd. attended the Planning Course at on His last three contracts were all completed within the contract period. If you are in doubt, we have his permission to invite you to phone him on (exchange and number) and ask his opinion of the course directly.

preparing the training material

No general training material can be used effectively without some modification to suit the conditions and needs in the country concerned. Therefore, the first task for the trainer who decides to use pre-prepared training material, such as the ILO Interactive Contractor Training modules, is to adapt the modules as necessary in accordance with the findings from a training needs analysis. It is important to allocate sufficient time and effort to this task.

ADAPTING THE MATERIAL

It is essential that the training material should reflect the contractors' own situation as exactly as possible. This means that course participants should be able to recognise the types and sizes of their projects, common construction methods, typical prices and wages, and so on. The main reason for this need to reproduce the physical conditions is that the contracting business is both an art and a science, and it therefore depends on intuition as well as on analytical ability. Part of the key to a contractor's success is a "feel" for measures like dimensions, costs and productivity outputs. If values used in the training are not representative of their daily work, many contractors will not be able to apply their judgement and intuition to understand and learn from the material. This is dealt with in more detail in Chapter 5 ("The ILO Interactive Contractor Training approach").

TEAM-WORK PREPARATION

It happens quite often that the material is prepared by the trainer alone or together with other trainers. Producing relevant, learning-effective material for contractors is,

however, a complex task. The trainer or training manager who wants to succeed should therefore look into alternative ways of organising the work which will give better results. When analysing the various possibilities, it should be remembered what the material is meant to do. There are three essential requirements, which are summarised as follows:

- the methods which are described must be technically sound from a construction management viewpoint;
- they must be the methods which are most useful to the participants, keeping in mind their work situation and their own limitations;
- the material must be presented in a way that ensures effective learning, i.e. it should be pedagogically sound.

A TRAINING TEAM

To fulfil all these requirements satisfactorily, the trainers need technical, managerial and training skills and experience. People with such a mixture of qualities are hard to find. In practice, material preparation is best done as teamwork. Suggestions for allocating responsibilities among a training team are given in table 8.

Table 8. Team-work model for material preparation

Function	Specialist team member	Task
Ensure that the material is technically sound	Builder or civil engineer with management experience	Draw up the methods together with the trainer or review the material
Ensure that proposed methods are those most useful to the participants, keeping in mind their work situation and personal limitations	Prospective participants representative of the target group	Use the information from the training needs survey, then consult the prospective participants to verify that the methods are appropriate for them and that they can be applied reasonably easily
Present the material in a learning-effective way	A confident trainer can use personal judgement. Alternatively, take advice from a training material specialist	Try different ways of presenting the material. Then, through testing or advice from specialists, make the necessary modifications

To make this way of working really effective, the trainer may want to form a working group which includes a construction management specialist, one or more

members of the target group and a training material specialist. This puts the trainer or the training manager in a position of co-ordinating the various contributions. If writing the material is contracted to a training material specialist, very tight supervision will have to be exercised by the trainer. However, if it works well, it has the advantage of putting the trainer in an evaluating role and thus allowing more time to improve further the overall training programme.

THE COURSE INGREDIENTS

If the training materials are to provide the basis for developing a construction management skill, they must contain a variety of ingredients, each one playing a defined role in building the skill. The most important ingredient is the learning text, which describes the management technique to be learned. However, building or improving a skill involves not only learning the right technique but also learning to apply the technique and to solve specific problems by using it. To meet these requirements, the material must contain supplementary ingredients to support the learning texts. In order to achieve this, there are four supplementary ingredients which are particularly useful —

- worked examples;
- exercises;
- quizzes;
- simulations.

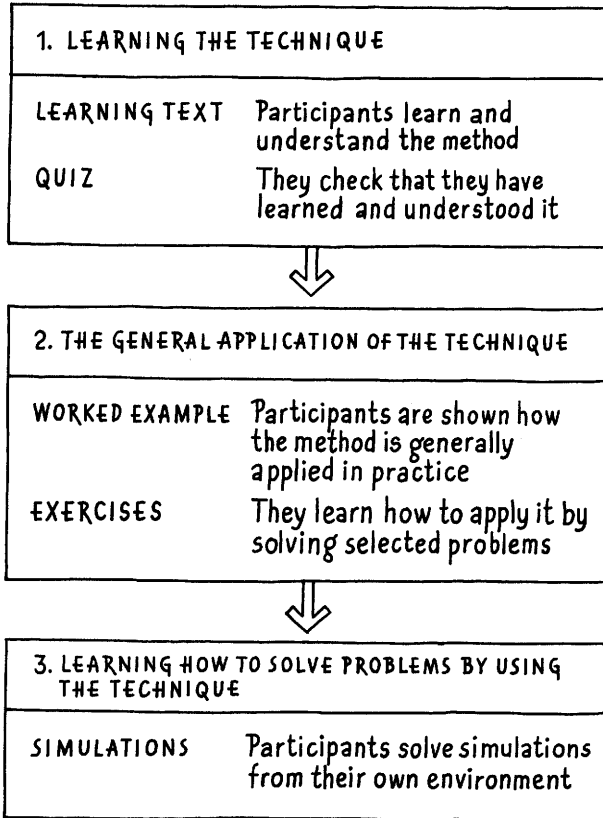
Remember that a construction management skill is built in three successive steps. The contractors —

- learn the technique in question;
- learn its general application;
- learn to solve their specific problems by using the technique.

All these four ingredients feature in the ILO Interactive Contractor Training (ICT) modules, the use of which is discussed in Chapter 5 of this guide.

Figure 17 explains how the various ingredients help the participants through the successive steps towards building a skill.

Figure 17. The use of the course ingredients



learning texts

Each module of training material should contain a learning text that describes the management technique which is to be learned. The learning text can be used as a basis for lecturing or it can be studied and discussed by the participants in groups. This is the first step towards providing the participants with a skill, in that it provides knowledge which forms the basis for the skill. The learning text can also be used to motivate the participants by describing how the skill can help them improve their businesses.

quizzes

Short quizzes consisting of five to 20 relatively simple multiple-choice questions are a feature of the ILO Interactive Contractor Training (ICT) learning material.

They are used partly to check the extent to which the participants have retained and understood the learning text, but also to encourage discussion between the participants. Quizzes, as distinct from worked examples and exercises, are deliberately designed to allow most participants to achieve high scores. The result is that they are likely to gain confidence and be encouraged to proceed keenly to the next section. A low score enables the trainer to identify those parts of the learning text which were unclear on first reading and explain them in more detail. The quiz may be done individually or in groups. It can be made competitive by recording the score of each participant or group so that the winner is the one with the highest score. Apart from being a useful training tool, the quiz adds variety to the course.

Quizzes are used mostly for topics in which answers to questions are clearly either "right" or "wrong", such as standard calculations using given basic data. The quiz technique is therefore most applicable to subjects of this kind, such as the estimation of materials quantities. Other topics such as project planning depend largely upon the application of intuition and judgement and may not be equally well suited to the quiz technique.

worked examples

A worked example is an illustration of how a particular construction management technique is applied in a practical situation. For example, if the learning text describes the drawing of a bar chart, then the worked example may show, step by step, how a bar chart is prepared for the construction of a house.

The worked example may be presented by the trainer, but experience has shown that learning is more effective when the text is studied and discussed by the participants in groups. Some of the worked examples can be made to contain deliberate mistakes, because, again, experience has shown that this adds to the interest and attention that the participants devote to reading the text. Participants usually enjoy competing (either singly or in groups) to identify the errors. In this way, they are most likely to go through the calculations thoroughly and, since they have to find the mistakes, they are forced to understand the mechanism of

the theory. The search for mistakes can be made more competitive by asking the groups to list the mistakes and naming as winner the group which has found the most.

exercises

By solving an exercise the participant is able to learn how a technique is generally applied to a situation, and to face up to some of the problems one always encounters in applying a new technique.

Exercises may be solved in groups or individually. The former is preferable since the interaction with the other group members reinforces the learning. Some exercises can be made competitive, such as the preparation of the most effective and realistic project plan. The "winner" in such a case may be nominated by the trainer, voted on democratically or perhaps chosen by an outside expert.

simulations

Simulation is the last step in building a managerial skill. It is a model of a task or problem taken from the participants' work environment which they solve in the classroom. Whereas exercises show how a technique is generally applied, a simulation enables the contractors to learn how it can be applied to their own situation. After having solved a simulation (or simulations), the contractors should be able to practise the skill back on the job.

There is an important difference between a simulation and the other parts of a learning element. From the learning text, the worked example and the exercises the contractors learn the mechanism of applying a method in a more general sense. When solving the simulation, they use their judgement to apply a mixture of what they have learned and their past experience to develop the skill pertaining to their specific situation.

A simulation should be derived from the contractors' own environment in order to have the desired effect. It is best solved in groups.

CARRYING OUT THE TRAINING 4

building a methodology

METHOD AND METHODOLOGY

Both terms are used in this guide. Although they are closely inter-related, they have quite different meanings. Method is defined as a technique or a "manner of proceeding towards the accomplishment of an end", whereas methodology is the science dealing with the theory of method and classification.

For our particular purposes a training *method* is defined as a particular way of training, e.g. lecturing, discussions, group work, and so on. A *methodology* is the overall procedure used, which is normally a combination of different methods. For example, if a participative method is chosen for a topic, but with intermittent spells of lecturing, then these are the two methods used. Together they form a methodology, as shown in figure 18.

Figure 18. Example of training methodology

TIME	15 min.	30 min.	15 min.	45 min.	30 min.
METHODS	Lecture	Group work	Lecture	Group work	Discussion

CHOOSING A METHODOLOGY

Trainers are free to choose which methodology to use, based on their individual judgement. This guide describes the mechanisms of the methods and the criteria for selecting a certain methodology. It does not advise on which methodology to use, because this depends on the

characteristics of the trainer, the characteristics of the participants and the nature of the topic. However, the choice of methodology is crucial for the outcome of the training. The material may be excellent, the facilities may be modern and the participants may be eager to learn. However, none of this helps if the chosen methodology does not encourage a rapid comprehensive transfer of knowledge and skills.

The prerequisite for selecting and developing the optimal methodology for a course is open-mindedness. Most of us have preconceived ideas of how training should be done. It is not surprising, for example, that many trainers resort to the lecturing method, having been exposed to years of incessant formal teaching throughout their education. This also accounts for the numerous failures which have occurred in training over the years. This is not to say that lecturing never works, but the decision to lecture is often made without appreciating its limitations and the prerequisites for its success.

SEARCHING FOR THE SOURCES

Carrying out an objective search for the optimal training methodology means identifying the various sources of knowledge and experience which can contribute to the learning process. It is important to remember that the purpose of a training course is to achieve learning and thereby a change in *behaviour* among participants. It should also be borne in mind that there are a variety of options which can contribute to this process, and that they can be mutually supportive. Thus the trainer will be able to contribute to the participants' understanding of the training materials as a result of his or her personal experience but, if the course is properly structured, the participants should be able to learn a good deal from each other. It may also be helpful to draw upon outside specialists to contribute on particular topics.

The main function of the trainer is carefully to select the sources that are most appropriate for acquiring a certain skill or body of knowledge, and then facilitate the learning in the most effective way possible. The most common sources are training materials (including audio-visual aids), fellow participants, invited specialists, field work and the trainer. In the search for the appropriate source and

methods of learning, it is important to put oneself in the place of the “receiver” (i.e. the individual participant) in order to understand exactly what will be the most effective way for him or her to learn. A common mistake in training is to see the training process from the point of view of the “transmitters”, i.e. the specialists, the trainers or the organisers. A training process which is designed from this angle is likely to succeed only by chance. It is essential to remember that the participant is the owner of the problem and is the one who ultimately has to solve it. It is therefore vital to see the training process from his or her point of view.

Once the various sources of knowledge and experience have been identified, the next step is to analyse how each one of them can contribute to learning. Different learning topics will require the use of different sources.

For example —

- the theory of network analysis for project planning may be best suited to training material with the support of the trainer;
- the application of network analysis to construction projects may be best taught by an invited specialist, say an engineer working for a large construction firm;
- the application of network analysis to the type of projects undertaken by the contractors may be best learned through discussions with fellow participants.

MAKING SURE THAT NOTHING IS LEFT OUT

When deciding on which source, or which combination of sources to use, the trainer should try to get a clear idea of exactly what needs to be learned. It is often found in the training of contractors, and of entrepreneurs generally, that the conventional theory of a topic alone may not cover what they need to know. The basic theory of a method, say estimating, is universal and is useful for a contractor to know. However, there is often a gap between the basic principles and the way in which the method can and should be applied by the contractors in a particular area. This gap also has to be bridged in the theoretical part of the training (or the “learning text” part in the ICT methodology).

example: calculating the amount
of concrete needed

In estimating and tendering, it is necessary to know how to calculate the amount of cement needed for a cubic metre of concrete. The method can be found in any basic textbook on estimating. It is worth learning because cement is expensive and concrete is probably the most important and ubiquitous construction material. But it is surprising how few small contractors can make this calculation which is so basic to their business. What is of interest to the trainer is that, to be effective, contractors need to understand how to go about it on two levels. First they must understand how to make the calculation from first principles, because every entrepreneur needs to appreciate the costs of key inputs so that they can be properly controlled.

However, practical contractors also know that it is not necessary to make this relatively complicated calculation every time they bid for a new job. For example, there may be readily available tables for calculating the amount of cement, published by the Ministry of Works.

This is where the second level of understanding comes in. Contractors are always busy, and they need to find short cuts if they are to complete all the many different tasks that they face in a typical working day. Unless the trainer has been a contractor or has worked for a contractor, he or she will not know the short cuts with the result that the course will be one of the many dismissed as "nice in theory, but no use in solving practical problems". The trainer needs a way to encourage the emergence of practical solutions, and the chosen methodology should encourage this. In this case, assuming that the trainer does not have personal experience of estimating for local building projects, the "gap" could be identified and filled by conducting discussions, for example with one of the contractors, or with an outside specialist who has been invited to give a lecture.

This example is technical, but there are many similar examples in the business and organisational spheres of gaps between the conventional theory and the theory which is applicable to the contractors. One is the calculation of profit to be included in the tender. This is a purely business consideration, which is subject to intuition, judgement and

thorough knowledge of the market conditions. The basic theory of how profit is added to the various components of a tender, and what factors should generally be considered when deciding on the percentage, should be included in the learning text. It is important for contractors to understand this. However, there are likely to be local factors affecting the profit margin, related either to clients, existing market conditions or national regulations, which will affect the decision on the profit margin and which should also be known to the contractors. If such specialised information cannot be covered in the training material or by the trainer, the other sources described above should be explored.

IDENTIFYING THE METHOD

The training method to be used depends on which sources of knowledge have been selected for the topic. If a topic is to be covered by an invited specialist, for example, the most appropriate method would probably be a lecture, but this should be followed by a discussion. A combination of sources can often be more effective than total reliance on a single source.

Figure 19 shows the various methods which are appropriate to the different sources of knowledge.

Figure 19. Sources of knowledge and training methods

Source of knowledge used	Training method
Training material	<input type="checkbox"/> The participants read the learning text individually <input type="checkbox"/> The participants study and discuss the learning text in groups <input type="checkbox"/> The trainer lectures from the learning text
Fellow participants	<input type="checkbox"/> Discussions, either in groups or in plenary <input type="checkbox"/> Participants work through the learning text together
Trainer	<input type="checkbox"/> Lecture <input type="checkbox"/> Discussions with the participants
Specialist	<input type="checkbox"/> Lecture <input type="checkbox"/> Discussions with the participants

A combination of these methods is required to achieve effective learning:

Basic theory	+	Practical information	=	Complete theoretical knowledge
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USING SPECIALISTS

It may be clear at the stage of preparing the training material that certain topics are best taught by specialists. Examples of specialists' functions are special methods of estimating (invite a quantity surveyor), quality control of certain work items (invite a site engineer) or certain aspects of contract law (invite a lawyer who specialises in construction). The specialist should be invited well in advance to allow sufficient time to prepare properly for the session. The advantage of being able to foresee the need at an early stage is that it leaves time to look around for the one person who is most suitable for the task. It may of course happen that the need for outside assistance only becomes clear during the programme, in which case the trainer may have to choose someone who is close at hand.

The specialist should be briefed thoroughly on the function to be fulfilled. For example, it is not enough to ask a quantity surveyor to give a lecture on how to calculate volumes of earthworks in estimating. The briefing should cover the kind of projects the participants estimate for, options for transferring the skill and the specific objective of the session. In fact, asking a specialist to give a lecture may not be the best approach. One alternative is to ask the specialist to assist the participants to solve exercises and simulations or to support the trainer by explaining complicated parts of the learning text and leading discussions.

USING SPECIALISTS FOR MATERIAL

PREPARATION

A specialist can also be employed to write training material. Lecturers should be asked to provide a copy of their notes, so that they can be edited into the appropriate learning text format by the trainer or whoever is responsible for writing the material. This is useful whether or not the specialist is able to continue to come and give lectures.

Another area in which a specialist can be used is for writing exercises and simulations. A lawyer, for example, who has years of experience with negotiation of contracts, is likely to have access to material which can be used for

simulations. Managers of construction projects, for example, have access to drawings, project programmes and site layouts.

COMBINING INTO A METHODOLOGY

Building an overall methodology is achieved by a judicious combination of ingredients. It is worth taking time over this decision, since there is a wide variety of combinations of methods possible for building a skill. The way in which the methods are combined depends on the topic in question and an assessment of how the participants are likely to react.

Below are a few examples.

INTRODUCTION (Lecture)	QUIZ	LEARNING TEXT (Participative)	EXERCISE	QUIZ	SIMULATION
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Feature: The same quiz is run twice to check the participants' knowledge level before and after working through the learning text. The first run of the quiz will help the participants to identify the weak areas on which they should concentrate while working through the learning text.

LEARNING TEXT (Lecture)	LEARNING TEXT (Participative)	QUIZ	EXERCISE	SIMULATION
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Feature: The learning text first forms the basis of a lecture and is then run participatively to reinforce the learning process. This may help if the participants' initial level of knowledge is low, so they will benefit from a two-stage approach.

LEARNING TEXT 1	SIMULATION 1	LEARNING TEXT 2	SIMULATION 2	LEARNING TEXT 3	SIMULATION 3	QUIZ
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Feature: For each part of the learning text, a corresponding part of the simulation is solved. This is useful in a topic like estimating and tendering, where individual learning units (e.g. estimating for groundworks, concreting, carpentry, services, etc.) need to be integrated to provide an appreciation of a complete process.

LEARNING TEXT (Participative)	SIMULATION 1	LECTURE BY SPECIALIST ON SPECIALISED ITEMS	SIMULATION 2	DISCUSSION
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Feature: More advanced items are lectured on by a specialist and followed by a corresponding simulation.

TRIAL AND ERROR

The optimal methodology usually emerges gradually through trial and error. Having chosen what seemed most suitable for the first course, the trainer will discover that some methods can be rearranged to make the training more effective. The same course may be run many times before the methodology for the various learning elements is fully refined. Naturally the trainer will try to improve the methodology as quickly as possible by monitoring the learning process with a critical and sensitive eye. Are the effects of the various parts of the element (learning text, quiz, exercises, etc.) being achieved, so as to allow the building of a skill to take place? This can be monitored in two ways —

- the contractors' ability to understand a text or solve a problem correctly. For example, if the exercise turns out to be very difficult to solve, it may mean that the theory has not been learned properly. A possible solution may be to reinforce the learning text with a lecture;
- the atmosphere. For example, a low activity level in discussion periods, or obvious lack of attention to a lecture, may indicate that something is wrong with the methodology.

By asking the participants how they feel about the methodology used, the trainer is able to find out what does and does not satisfy them. The extent to which they are comfortable with a methodology is also an indication of the methodology's learning effects.

IS THERE A BETTER WAY?

Having monitored the effects of a certain schedule of activities, the trainer should set out to find alternative solutions that might be more effective. The keyword here

is innovation. However successful the last course has been, there is almost certainly a better way. It is a question of thinking constructively about each activity. What went better than expected? What went worse? Why?

The trainer should then try to find alternatives. At the first stage, nothing should be rejected and everything written down. This is known as the “brainstorming” technique of problem solving. Then, when a list of all the alternatives which could improve the methodology has been made, the one that seems most effective may be selected.

The process does not stop there. The new method can be tried out and monitored. The trainer may then go through the process again until he or she is confident that a satisfactory approach has been achieved.

It is important to remember that people change, needs change and criteria and standards change. No solution to a training problem can be accepted as fixed for all time. This is the reason why all training — particularly contractor training — is such a challenging, worth-while and stimulating experience. Effective trainers identify and examine all the alternatives which can improve the methodology. They then select the one that seems most effective, try it out, monitor it and go through the process again and again until a satisfactory approach has been achieved.

the participative method

LECTURING OR PARTICIPATION?

Throughout the process of planning a training programme, the effective trainer will be seeking to resolve the dilemma of which method to choose. Sometimes there is little room for doubt. Exercises, quizzes, worked examples and simulations are most effective when done by the participants themselves, either individually or in groups. However, for learning the theory of the management skill in question, i.e. the content of the learning text, there are principally two main methods to choose from —

the participative method (the participants work

through the learning text on their own without interference from the trainer);

- the lecturing method (the learning text is used as the basis for a lecture which is delivered to the participants — either by the trainer or an external specialist).

In view of the importance of this decision, the following two sections are devoted to the relative advantages of the two methods. More emphasis is given to the participative method for two reasons. Firstly, training in the construction industry is frequently rooted in a formal and technical tradition in which the role of “teacher” or “lecturer” is jealously guarded. Thus modern developments with action learning and other specialised approaches to participation are rarely implemented or even tested. Secondly, ILO experience suggests that participative methods are highly effective with contractors, who are usually individualistic by nature and who have much to offer each other in the way of hard-won experience, provided that the trainer is a sufficiently skilful facilitator to set the scene and encourage productive interaction.

KEY CHARACTERISTICS

In the participative method, the participants work through the learning text in groups by reading and discussing it. The learning takes place as a combination of learning theory from the text and relating the theory to the participants' own situation through interaction with other contractors with complementary experience.

CRITERIA FOR SELECTING THE PARTICIPATIVE METHOD

The following criteria need to be fulfilled if the participative method is to succeed:

- the participants should be literate;
- the material should be in a language which they master;
- the participants should be comfortable with the method;
- the trainer must be sufficiently sensitive to analyse and maintain a high level of activity;
- the learning text should be of high quality — clear, concise and comprehensive.

HOW IT WORKS

The participants are divided into groups of three to six persons. The groups work through the learning text of the topic at the same time. They are given two options of working with the text —

- either reading individually a paragraph at a time, then discussing the paragraph within the group; or
- taking turns to read aloud parts of the learning text, and stopping whenever there is something that one of the group members wants clarified or is able to supplement from personal experience.

The fundamental principle is that no paragraph or part of the learning text should be commenced before the previous one has been understood by every member in the group. Experience has shown that by putting their resources together, all the group members are able to gain a comprehensive understanding of the theory. When something is unclear or a complicated concept is explained, there is always someone in the group who understands it and is able to explain it in his own words to the others, or the group may solve it together. One of the most important ingredients of the method is that contractors draw on personal anecdotes to complement the theory. This provides a powerful reinforcement to the learning process.

THE TRAINER'S ROLE

In the participative method, the sources of knowledge are primarily the learning text and fellow participants, although the trainer may contribute whenever a topic is within his or her area of competence. The trainer is essentially a *facilitator* of the transfer of knowledge between the learning text and the participants, and between the participants. There are basically *four* elements in the trainer's role:

- co-ordinating the learning activities — organising the participants and giving the necessary instructions;
- feeling the atmosphere in the seminar room to make sure that the learning process is going on as it should. If it is not, identifying the causes and taking remedial action;

-
- identifying issues that should be discussed or explained in further detail;
 - taking action by preparing short lectures, inviting particularly knowledgeable and experienced participants to instruct their peers, or leading discussions.

Although the participative method requires more activity on the part of the participants, it does not mean that less is required from the trainer. On the contrary, the trainer's function is a continuous process of monitoring and analysing the situation in the seminar room, always preparing for action beforehand in order not to delay the schedule and participating as fully as possible in the learning activities.

REQUIREMENTS OF THE TRAINER

Because the primary sources are the learning text and the participants, the trainer does not necessarily have to be a highly qualified construction management specialist. But a construction background is useful so that the trainer can demonstrate sufficient technical knowledge and experience to attain credibility and respect from the participants. Although certain technical qualifications are desirable, there are two overriding qualities which are crucial to the success of the method —

- awareness to understand when and when not efficient learning is taking place and to take the correct action to keep the learning at a high level;
- an ability to respect and understand the contractors — the ways in which they approach their problems and the conditions they face in their daily working life.

THE PROCEDURE

Using the participative method involves the following steps:

1. Divide the participants into groups.
2. Introduce the topic by outlining its content and the purpose. Explain how it can benefit them in running their businesses or executing their projects.
3. Instruct them how to work through the learning text. Give them the option of the two ways explained above.

-
4. State the time by which they should have completed the learning text.
 5. Walk around and make sure that all the groups are active and give advice whenever necessary. Make a note of issues which are either unclear or controversial. Make sure the participants are not unnecessarily delayed by disagreeing about minor issues.
 6. When all the groups have finished, ask for their comments on the text. If there are parts which need a more detailed or comprehensive explanation, use the blackboard, flip-chart or overhead projector. Better still, a particularly knowledgeable or competent participant can be asked to clarify parts that are unclear to other participants.

DISCUSSING THE TEXT

The text should be considered by the participants as follows:

CHECK FOR AGREEMENT

One of the group members should find out if everybody in the group has understood and agrees with the text. If someone has not understood it, one or more of the other group members should explain it. If someone disagrees with the text, this view should be presented to the group.

DOES IT APPLY TO YOUR SITUATION?

The group as a whole should review the messages in the text that are important to them as construction managers. They should think about their experience and, if there have been situations which confirm the message in the text, share them with the rest of the group.

DOES IT SOLVE YOUR PROBLEMS?

The group should discuss how the method suggested in the text can be of help in solving their management problems in that particular field. They should analyse the factors that could make it effective and the factors that could make it less effective.

ARE THERE OTHER SOLUTIONS?

Those who have other solutions or methods should present them to the group. The trainer should make a special note of those that have been used and proved effective.

GETTING THEM GOING

The trainer still has the responsibility to see that learning takes place. So while the groups go through the text, he or she should walk around and make sure that all the groups are active. Especially in the beginning, some groups may, out of shyness or insecurity, not be able to function efficiently. Experience has shown that contractors, who often lack recent training experience, find this method awkward and artificial in the beginning. However, as soon as the groups start to function actively, they soon realise the potential of the method. But in order to get on the right track, an initial push must be provided by the trainer.

BEING ON HAND

After the groups have got going, it is necessary to make frequent tours of the seminar room, even if the general activity level is high. The reason is twofold. Firstly, it assures the participants that the trainer is concerned and committed to the task. This convinces them that the training is organised to help them improve in the best way possible. Secondly, it gives the trainer the chance to pick up points in the discussions which deserve a more thorough explanation and identify controversial issues which can be discussed in plenary session afterwards. One may even find that explanations and discussions after the sessions are as effective for the learning as studying the learning text. It may be tempting to sit back and let them "get on with it". This is a fatal mistake.

LISTENING AND LEARNING

A good indicator of the success of the participative method is the noise level in the seminar room. The more discussions and communication that are generated by the material, the more effective is the learning and the more the participants are involved in the learning process. If the noise level goes down, it means a drop in the level of involvement. Like a mechanic listening to a car engine to identify the cause of a fault, the trainer should investigate the cause of the diminishing activity level.

Fatigue is a common reason. The participative method is very intensive, and can be tiring for persons who are not

used to concentrated intellectual activity. Another reason may be that the participants are not happy with certain parts of the learning text, in which case their objections should be brought out into the open and discussed.

ROTATING GROUP MEMBERSHIP

Rotating the membership of groups can contribute to the learning process, because it enables each participant to interact with a wider range of competence and experience during the course. But it also breaks up group composition, which can be unfortunate. How often the groups should be changed is therefore up to the trainer to judge, but a suitable interval is typically every half-day or every day. Rotating group membership should not be done if it reduces the efficiency of the learning. Some participants may not feel comfortable with it and older, more respected contractors may resent being "shoved around". In some cases the group compositions are very good from the beginning, having the right mixtures of competence, experience and personalities, in which case moving them around will not improve the learning and may make it worse. However, it is advisable for the trainer to try out the idea of rotating the group membership on initial courses, monitor the effects and ask the participants how they felt about moving around among different groups.

SUMMARY

The *advantages* of the participative method are —

- the participants are actively involved in the learning process;
- the trainer does not need to be a construction management specialist;
- it is intensive, which means that in a given amount of time participants can learn more rapidly, so the course should provide better value for money;
- the interaction with the other participants helps to remove any negative attitudes to training;
- the experience and knowledge of the contractors is mobilised to aid and reinforce the learning process;
- the participants themselves set the pace of learning which suits them best;

-
- they get used to working in groups right away, which prepares them for more efficient solving of exercises and simulations.

The *disadvantages* of the method are:

- the participants have to be literate;
- the learning text has to be in a language which they (or at least some of them) have mastered;
- the learning text has to be of high quality and needs to be prepared far more carefully than, say, a lecture script;
- participants do not necessarily all receive the same information, because they work in different groups with varied experience.

the lecture method

KEY CHARACTERISTICS

The sources of knowledge used when the theory is presented in the form of a lecture are the lecturer and the learning text. The learning text serves as a basic script, to which the lecturer may add from personal knowledge and experience.

In the participative method, the supplementary but vital odd pieces of advice which come from years of insight and experience are provided by fellow participants. When the lecture method is used, these have to be provided by the lecturer in the main presentation or brought out during the discussion.

CHOOSING THE LECTURER

Good lecturers are hard to find. The required qualifications fall into two main groups —

- thorough familiarity with the contractors' situation — knowledge of their weaknesses and strengths, the ways in which they operate and the constraints that affect their performance;
- an ability to communicate, with sufficient sensibility and awareness to monitor and control the learning process.

In order to succeed, the lecturer must be able to contribute more to the learning process than the

participants could get from interacting with each other as they worked through the learning text. The lecturer must be able to earn the respect of the contractors. Very few people are inclined to listen to someone telling them how to solve their problems in a practical field when the lecturer's knowledge is purely theoretical. Unfortunately, it is difficult to find people who can command the respect of the contractors on the merits of what they have achieved and who are also competent lecturers.

The technical competence can be found with successful contractors, who will also carry respect. They may not be willing, however, to make an effort to upgrade other contractors if they regard them as competitors, and they may also lack the necessary communication skills.

Others who are likely to carry respect among the contractors are site engineers or project managers working for large companies or a Ministry. These people are more likely to possess communication skills, but they may not know enough about the contractors' actual problems and capabilities to enable them to adapt to the needs of the participants.

Trainers should think carefully before opting for the lecture method and, if they should decide to do so, they should take great care over choosing a suitable candidate. For those who are genuinely interested in training contractors for results, lecturing is not an easy way out. For those trainers who decide to make use of the lecture method, we offer some advice in the following paragraphs.

THREE STEPS IN A LECTURE

Giving a lecture involves three major steps —

1. The *introduction* should be brief and to the point. It presents the theme and objective of the talk in a manner designed to arouse the interest and curiosity of the audience right from the start. Opening remarks need to be planned and rehearsed with some care, as it is very largely that first impression which will motivate the audience to go on listening or to "switch off".
2. In the *body* of the talk, the main theme is developed in logical steps so that the most important points will be remembered. One step should quite naturally stem from the previous one so that the argument is carried forward. Illustrative examples should be added, related

to the audience's experience where possible, as well as anecdotes and instructive demonstrations to support the points being made. Visual aids should be used to help the audience understand and remember what is important. These should be shown sequentially, as each new point is raised. The participants will appreciate being involved in the learning process. Therefore it is important to encourage two-way communication. This can be done by asking for comments as key points are made or by inviting individual participants to share their experiences and underline points made by the lecturer.

3. The type of *conclusion* will depend largely upon the objective, It should include a brief recapitulation, in different words, of the main points (this is made easier when a visual display has been developed throughout the talk), as well as some indication of "where do we go from here?" The quality of the conclusion may determine whether the overall objective has been achieved. For this reason, many speakers learn their conclusions off by heart.

BEING AWARE

As with the participative method, lecturing requires constant monitoring of the learning process. It is easy for a participant to "switch off" when the lecturer describes something which does not appear to be particularly interesting and useful. Having switched off once, the participant is likely to miss other important and more relevant information. So the lecturer has to be sufficiently sensitive to recognise a fall-off in attentiveness and immediately do something to boost it again. This requires an ability to identify the reasons for diminishing interest among the audience. Here are some possible causes —

- the points made are not entirely appropriate to the contractors' situation;
- the solutions suggested to their problems are not good enough;
- the posture, appearance or manner of the lecturer is not convincing;
- the pace may be too fast or too slow (or may not be sufficiently varied from time to time to make the presentation more lively);

-
- the lecture can be seen to consist of one-way communication, owing to a failure to encourage the participants to make their own points or ask questions.

LIMITATIONS

Only a certain percentage of what is contained in a lecture is remembered by the participants. How much is remembered depends on the quality of a lecture and how useful the participants consider it to be. However, experience shows that even if the quality of the lecture is good the participants will not be able to remember more than a small proportion of the content.

One way of getting a feel of the limitations of a lecture is to attend some, and then try to write down and analyse exactly how much has been retained.

SUMMARY

The *advantages* of using the lecture method are —

- the same information goes to all the participants;
- the delivery of information is controlled by the trainer (although this may also be a disadvantage);
- it allows for the use of an outside specialist, who may be able to contribute more than the sources used in the participative method;
- it can be used in the training of illiterate contractors.

The *disadvantages* are —

- the participants are not actively involved in the learning;
- the trainer should be a construction management specialist, as well as possessing communication skills;
- the success of the method depends entirely on one person. If the lecturer performs poorly, the training will be a waste of time and money. The participative method is more flexible in this respect, since the learning text contains the basic theory, in addition to which the group members add their personal experience;
- the participants all have to adjust their pace of learning to the progress of the lecture.

running discussions

ILO Interactive Contractor Training methodology makes extensive use of discussions to ensure maximum participation by course members, and thereby accelerates the learning process. Traditionally, trainers have tended either to dismiss discussion periods as "a waste of valuable time" or have been somewhat afraid of them due to the danger of losing control. We believe that discussion periods are in fact an integral component of the learning process and that, far from losing control, the effective trainer can use them to gain vital information on whether the learning process is progressing according to plan and (if necessary) adjust his or her approach to achieve the desired outcome.

WHEN TO USE DISCUSSIONS

Contractors have many different ways of dealing with their problems and many different ways of looking at their businesses. This is reflected when they discuss a learning text or solve exercises and simulations together. Inevitably, controversial issues will arise. When there is disagreement within a group which may also concern the rest of the participants, the trainer should bring it out into the open and elicit the views of the other contractors.

In addition to dealing with controversial issues, a discussion can serve the purpose of letting the participants air their opinions on points made in a lecture or learning text, or the way the topic is dealt with in the training. This is useful in two ways; it gives the participants an increased sense of participation, which helps to maintain their motivation. It also provides the trainer with feedback at regular intervals about the course and ideas about how to improve it.

Short discussions are also useful when answers to exercises and simulations are presented, in order to clarify points which are unclear and elicit the views of the participants.

HOW TO CONDUCT DISCUSSIONS

The outcome of the discussion depends entirely on the trainer. First of all, it is essential to decide on the purpose

of the discussion. Is it to reach an agreement on an issue? Is it to enable the participants to give their opinions on a topic? Or is it something else? Having decided on the purpose of the discussion, the trainer should make sure that it gets off to a good start and keeps to the announced topic.

Techniques of leading discussions are not explained in detail here, since they depend on the norms for social interaction in a particular culture and also to some extent on the trainer's personality and knowledge of the subject. Nevertheless, based on ILO experience in running training courses for contractors, some brief guide-lines are —

1. *Be aware of the limitations of a discussion.*

The contractors in the training group may have been in the business for ten to 30 years; a broad exchange of views is not going to lead to a great change in attitudes. Moreover, the learning effect of a discussion is normally very small, since it is not a structured transfer of knowledge, but rather an exchange of experiences and viewpoints. What it can do, and do effectively, is to reinforce the learning of new techniques and new approaches and encourage their adoption.

2. *Set the time limit.*

Experience has shown that contractors, operating mostly on their own in a tough business, are most eager to discuss their problems. If the trainer is not particularly time-conscious, such discussions will tend to drag on for a long time. It is important not just to set a time-limit but also to take stock during the discussion, say every ten minutes, to see if it is progressing at a proper rate.

3. *Start with a clear introduction.*

The aim of the discussion should be explicitly stated. The topic should be announced clearly and concisely, and the time-limit defined.

4. *Be objective.*

Only an objective trainer can give the different arguments the respect and attention which they deserve. A trainer who appears to favour certain points of view will discourage other members of the group and inhibit them from openly saying what they mean. It may also reduce the motivation to learn later in the course.

5. *When there are conflicting views, show them all respect.*

It is tempting to overlook views which seem

unimportant or totally wrong. No matter how wrong they seem to the trainer, they are presented by someone who is probably sincere and who wants to contribute; hence they deserve to be considered. If someone's argument is ignored by the trainer, this is likely to result in lost motivation in the training sessions following the discussion. Naturally the trainer is free to correct impressions that are factually wrong, but this should be done in a way that shows respect and understanding for the person who has put the view forward.

6. *Search for common ground.*

Most arguments partly conflict and partly overlap with each other. Each round of discussion should be concluded by summarising what has been agreed upon. This is most important when the views conflict, so as to keep a reasonable degree of cohesion in the group.

7. *Make sure they don't digress.*

The aim of the discussion should be kept constantly in mind and the participants should not be allowed to drift off to another topic (this can always be noted and kept for another discussion at a later stage). If there are repeated attempts to lead the discussion on to other topics, it may mean that the participants are not happy with the present one. Then it may be better to find the causes and, if they are valid, change the topic and aim of the discussion.

8. *Tackle the difficult participants (if any).*

In almost every discussion there are people who talk too much, are too insistent, do not particularly care about achieving the aim of the discussion, and enjoy getting involved in personal arguments. These participants lower the efficiency of the discussion and should be dealt with. Techniques for tackling them vary greatly from culture to culture but if you are in doubt, it is often a good idea to seek confidential advice from other participants.

9. *Conclude the discussion.*

It is a good idea to choose a moment when a participant has neatly summed up the common viewpoint rather than abruptly to stop people talking. Otherwise the trainer may sum up the discussion and link it back to the training objective.

Figure 20 shows a checklist which should be useful to the trainer for assessing his or her personal performance as a discussion leader. Confident (and courageous) trainers may decide to distribute copies for the participants to fill in. Those who have sufficient courage to do this find that it will pay off in the long run. Trainers should remember that the course participants are their clients. If their views are taken into account over successive courses, trainers' performance should steadily improve.

Figure 20. Checklist for discussion leaders

CHECKLIST FOR DISCUSSION LEADER		Performance				
Key to performance		1	2	3	4	5
1 — Poor	4 — Good					
2 — Acceptable	5 — Excellent					
3 — Average						
1. TIME LIMIT	Was the time-limit adhered to?					
2. INTRODUCTION	Was the topic introduced well with a clear explanation of the aim of the discussion?					
3. OBJECTIVITY	Did the trainer avoid taking sides?					
4. COURAGE	Were all the different viewpoints given due attention?					
5. COMMON GROUND	How good was the trainer at identifying common ground between different arguments?					
6. KEEPING TO THE TOPIC	How good was the trainer at keeping the discussion to the announced topic?					
7. CONTROL OF THE GROUP	Did all participants have a fair chance to contribute?					
8. ACHIEVEMENT	Was the aim of the discussion achieved?					
9. CONCLUDING REMARKS	Did the trainer sum up the discussion clearly and concisely?					
10. SUMMARY ASSESSMENT	Did this discussion period help significantly in increasing participants' understanding of the topic?					

using video

THE ROLE OF VIDEO IN TRAINING

Video can be a powerful training aid provided that it is used correctly and provided that its limitations are appreciated.

But since it is a tool and not a toy, it should not be used for its own sake but should form part of a carefully designed and controlled learning process. It is therefore important to define exactly what role it is to play in the process of building a certain construction management skill.

TWO TYPES OF VIDEO

There are two main types of video films that can be used in training —

the teaching video

This is the video film that is designed to teach a method. It is usually costly since it requires extensive preparation. An hour of finished good-quality film can easily mean 200-500 hours of preparation, script-writing and text editing. Although such a video is expensive to make, once produced it can be replicated and run for large numbers of people. Its use is therefore normally limited to general courses which are rerun regularly.

the analysis video

This is a much less expensive option which is not a finished training product, but can form the basis for discussions, exercises or simulations. It will typically show unrehearsed site operations or sequences from a company's activities. With careful recording it can be put together without extensive editing because it will be used for analysis rather than learning. The analysis video can be a very effective tool when used in conjunction with simulations, especially on topics related to site operations

With modern portable video equipment, the product can easily reach an acceptable quality, even when recorded by "amateurs", and can give an excellent sense of immediacy since it is possible to take examples from operational sites in the locality of the participants.

THE LIMITATIONS OF VIDEO

There is a tendency to think that as long as one is able to produce a good video, it will take care of the training

needed. This is a gross exaggeration of the amount of learning which video is actually able to generate. Instead of simply assuming that it can replace and improve upon several training functions and methods, let us recall the steps that go into building a construction management skill and then see how the use of video fits in —

- learn the technique;
- learn how it is generally applied;
- learn to apply it to problems.

Where can a video film make an impact?

learn the technique

It is unlikely that someone can learn, say, to prepare a cash flow analysis just from watching a video, no matter how high its quality. Learning a technique means learning to practise something. A carefully prepared teaching video can describe a construction management technique, but that normally represents the limit of what it can do. If it is to have the desired impact, supplementary material should be prepared to enable the participants to practise and thereby learn how to apply the technique.

learn how it is generally applied

The application of a technique is best learned by solving exercises or studying worked examples. The visual impact of a video has definite limitations here.

participants learn to apply it

to their own problems

This is where simulations can be extremely effective. An analysis video can provide excellent background material for a simulation. For example, a video showing the sequence of site operations is very useful for learning how to organise a site for maximum efficiency. Instead of describing it verbally or on paper, the site is effectively brought into the seminar room. The same video can also be used during follow-up sessions to allow the participants to analyse the progress they make on a project.

problem-solving workshops

Contractors often face common, practical problems in the running of their projects and businesses. Examples of such problems are difficult access to finance, unrealistic bids by less competent contractors, shortage of skilled foremen and difficulties with obtaining settlement of claims for extra work.

The role of problem-solving workshops is to enable contractors to put their resources of knowledge and experience together in a structured way to analyse and remove external constraints of this kind. At such sessions, the trainer performs a facilitating function of the kind performed by a quality circle leader. The principle is to start with a clear definition of the problem, and then proceed step by step until there is agreement on how the problem can be solved (or at least minimised).

AWARENESS

The trainer has to be very active during such sessions without imposing opinions. It is important to the participants to feel that they themselves formulate and solve the problem. A major keyword for the trainer's behaviour is *awareness*. Some participants will be more active than others. Respect and attention must be paid to the more active ones, but the effective trainer will also try to bring as many as possible into the discussions by asking for their views. It should be borne in mind that the trainer should not seek to impose his or her personal views, but should encourage the emergence of an agreed viewpoint based on the collective store of knowledge and experience.

When organising for the discussions, the trainer will find that some parts of the procedure are most effectively carried out in small groups, others in bigger groups and others again in plenary session with all participants present. Here again great care should be taken to arrive at the group composition which is most effective.

Nothing worth while is easy at first, and people are always uncomfortable in new situations. To make it easier to gain acceptance and to encourage them, the trainer should repeat the object of each step of the procedure as it is reached. In doing this, no doubt should be left in the

minds of the participants that the procedure will end up in a specific course of action for solving a particular problem that they have themselves identified.

WHY SHOULD COMPETITORS WANT TO EXCHANGE IDEAS?

This is an argument which is used frequently. However, experience shows that it is often exaggerated. The reason is that contracting is not only a tough business but also a lonely task. Therefore, the comfort the participants find in sharing their problems and successes tends to override the desire to keep their business "secrets" to themselves. But there is a prerequisite for an exchange of ideas to take place. The topic and methodology must be carefully selected. In addition, the personality and conduct of the trainer must be such as to encourage discussion.

WORKSHOP PROCEDURE

An analysis of the workshop method implies a structured step-by-step procedure such as —

- definition of the problem;
- description of the problem (when, how and why it occurs);
- assessment of the extent of the problem (what it consumes in terms of money, time and resources for the contractors);
- ways in which the problem has been solved before;
- brainstorming for solutions;
- identifying the best combination of solutions;
- formulating the action plan;
- implementing the action plan.

example: a problem-solving workshop in Botswana

This is how the procedure was used at a training session for a group of contractors in Botswana. What is described here is a brief distillation of the outcome of a series of wide-ranging discussions.

1. *Definition of the problem.*

Contractors often have to carry out extra work, but are not properly reimbursed.

2. *Description of the problem.*

When: At any time during the contract;

How: The contractor has to carry out extra work, and then submit a claim in order to be paid;

Why: These claims are often not paid in full —

- because the client's change in requirements is not properly recorded;
- because of unclear drawings or specifications;
- because of unforeseen technical problems beyond the control of the contractor.

3. *Assessment of the extent of the problem.*

The 12 contractors who are in the group lose between them 100,000 pula (approximately US\$56,000) a year, an average of US\$5,000 per contractor.

4. *Ways in which the problem has been solved before.*

Some contractors have managed to solve it by being very persistent and by approaching the people at an appropriate level of seniority in the client organisation, and explaining their problems.

5. *Brainstorming for solutions.*

Solution A: Set up a claims committee within the Contractors' Association to provide mutual support in submitting and settling claims.

Solution B: Each contractor brings information on past and present claims to the next seminar. They analyse the different cases and advise each other on how to proceed.

6. *Identifying the best combination of solutions.*

They decided not to proceed with Solution A until the Association is adequately organised. However, they decided to proceed with Solution B.

7. *Formulating an action plan.*

It was decided that each contractor was to bring the following information on past or present claims to the next seminar:

- contract sum;

- type of project (site, buildings, location, etc.);
- client;
- at what stage during the project the claim occurred;
- the size of the claim;
- the causes of the claim;
- technical details of the claim;
- their calculations of the claim;
- loopholes used by the client to avoid settling the claim;
- strategies used by the contractor to ensure that the extras are paid for;
- discussions with the client on the claim and the end result;
- how much of the original claim was paid.

8. *Implementing the action plan.*

During the seminars which followed, the contractors analysed one another's claims and advised one another on how to proceed.

ACTION TRAINING SESSIONS

As an alternative to organising a full problem-solving workshop, it is possible to include one or more action training sessions within a training course. The objective is for the participants to identify a specific problem area, and work together to determine a solution and formulate action to implement it. Action training is now an established technique, and consists of the following five steps:

1. *Define problem areas.*

The most important problem area is defined together with the participants. This does not only ensure that the most pressing problem is dealt with, but it also makes the participants feel that they take part in identifying what they see as most important. This motivates them to become more active during the training sessions.

2. *Determine critical incidents.*

This means getting participants to recall incidents from their experience where such a problem occurred. It almost becomes a story-telling session, but it is useful in the sense that the issue is reinforced. The skilful

trainer will be able to assess the effects of the critical incidents in, say, terms of profit lost or ways in which the working conditions were adversely affected.

3. *Determine causes.*

What are the most common reasons for the problem? A brainstorming session among the participants should bring this out. It is important that every suggestion is written down, on either a flipchart, a blackboard or an overhead projector.

4. *Decide upon solutions.*

This can be done in a number of ways, depending on the type of problem. In some cases a brainstorming in plenary session is effective. In others, it is more effective to allocate separate tasks for group work.

5. *Prepare for action.*

The solutions are useless if they are not implemented. The trainer should therefore work out a format for the participants to prepare a plan of action showing how they are going to put the solutions into practice.

example: an action training session in Botswana

At a seminar in Gaborone (Botswana), an action training session was held with the participants at a seminar on site supervision. A search was made for critical incidents which the participants had encountered in connection with the supervision of their sites. Three important incidents were brought up and discussed.

Contractor A recalled that once on his site the supervisor caused a 2,000 pula (US\$1,100) loss to the company because he had not checked the measurements properly. As a result, several cubic metres of cast concrete slab had to be broken up and reconstructed.

Contractor B remembered employing a site manager who had poor relations with the workers. When the workers protested by refusing to work for three days, he was unable to solve the conflict. Three days' idleness cost the company at least 500 pula (US\$280).

Contractor C recalled a project where the workers went on strike for several days because their payment was delayed. The delayed payment was due to poor short-term planning by the site management. The strike cost the company 1,100 pula (US\$600).

Having identified and analysed the critical incidents, five simple rules for effective site supervision were worked out by the participants —

- there should be an incentive for the site manager, for example a bonus if the project is completed on time;
- the site manager must get on well with the workers. While commanding respect, a good manager will be ready to listen to genuine complaints and should be aware of situations that could give rise to future difficulties and deal with them before complaints arise;
- the site manager must be trained to prepare weekly programmes for labour, plant and materials;
- the site manager needs to be able to read drawings and to understand specifications;
- there should be a relationship of trust between the workers and the contractor.

advisory services

PURPOSE

The main purpose of an advisory service is to help the participants to apply the learned skills in their jobs. Even the best of training courses will leave gaps between what has been learned and what is needed in order successfully to practise the skill back on site or in the office. It is this gap that the advisory services should fill by extending the classroom training to tackle specific on-the-job problems. But they can also lead back to the seminar room. If an adviser or consultant discovers, for example, that a large number of their clients are still weak in one particular area, it is a better use of time and money to organise further training rather than continue giving individual advice.

Another important function of an advisory service is to monitor how the participants apply the skills they have learned and then report back to the trainer. This enables the trainer to modify the content or methodology of the programme. Skills that were not applied were either inappropriate to the participants' needs or they were not learned properly. If techniques are applied which were not

included in the seminars, it may be that they should be added to the existing training content.

Advisers can also obtain basic data for case studies and suggest, based on their practical knowledge of the contractors' weaknesses, what specific skills should be emphasised in future.

SELECTING THE ADVISERS

Advisers can either be independent consultants who work in occasional collaboration with the training centre, or can combine the roles of trainer and adviser (with say 50 per cent of the working year devoted to each role). The combined role offers certain advantages, in that it ensures that the trainer will be in touch with practical developments in the industry.

Clearly potential advisers should be familiar with the management techniques which are most appropriate for those who are to be helped. In short, they must know how a construction business or a project should be run. The second most important requirement is that they understand their clients — their mentality, their potential, their weaknesses and the constraints which are imposed by the environment within which they work. Understanding also implies respecting the client. Effective consulting is a product of a two-way communication and it will not take place unless there is both respect and understanding.

If advisers do not also possess formal training skills, it is at least important that they should be made familiar with the other components of the training programme. This will also enable them to contribute material for simulations and to advise the trainer on the optimum content of the training sessions. It will then be clear what proportion of the trainees can be reached through on-the-job advice.

HOW MANY CAN BE HELPED BY AN ADVISER?

Running an advisory service is a costly way of reaching individual clients. A key question is: How many clients can be helped by a single adviser? The answer clearly depends partly on the extent of the assistance needed by the individual participants or the individual company. Let us for

the sake of argument assume that one week is set aside for each company a year for advisory services. Bearing in mind a realistic allowance for report writing, attending meetings, preparing budgets, travelling, and so on, it is unlikely that one adviser will be able to assist more than 30 individual enterprises.

The larger the number reached per adviser, the lower will be the cost per client. But if an advisory service is spread too thin, it may be ineffective. The factors to take into account are —

- the capacity or skill of the adviser;
- the extent of the assistance to be given to each individual. The more in-depth assistance required, the more the time that will be needed;
- the geographic spread of firms. The further apart they are, the more the time that will be taken up by travelling;
- transport facilities (the availability of vehicles and fuel, the standard of the roads, etc.);
- the amount of time taken up by other duties which the adviser has to perform;
- what proportion of the advice can be done by the trainees coming to the adviser rather than the adviser spending time travelling from place to place.

ALTERNATIVES TO INDIVIDUAL ADVICE

If the total advisory capacity is such that only a small portion of the clients can be reached, it becomes necessary to look at alternative models which can provide a similar service to larger numbers of people. This would inevitably mean bringing participants together in advisory clinics. It may not be as effective as advising them individually, but with an imaginative design quite satisfactory results could well be achieved.

ADVISORY CLINICS

Advisory clinics could be run by appointment for groups of contractors in a certain area, or integrated into training sessions. The participants could be required to prepare for the clinic by defining their problems and collecting data according to an agreed format. This preparatory stage

requires a great deal of sensitivity on the part of the trainer. A too tight brief, such as "bring your site plan and full specification of your plant equipment if you have problems with organising your site" might leave out important peripheral information. On the other hand, a too open brief, such as "bring information on your problems" might not provide sufficiently detailed information to help in a diagnosis of the problems. The best thing is to start in a confined area where it is certain that the majority of participants need to develop their skills.

RUNNING AN ADVISORY CLINIC

Someone has to take the leading role in running the clinic. In some cases this may be the trainer, but it is often better for the group to choose one of their own members or select an outside adviser. Effective clinic leaders are often better at listening than at talking, since the role of the clinic leader is to create a forum where the participants themselves contribute to finding solutions to individual problems. The authoritarian approach ("tell me about your problems and I'll solve them") will not work. Tact has been defined as "the ability to see things from the other person's point of view", so advisers should start by putting themselves in the place of their clients. Some groups are easier than others, but it is always necessary to make the individual feel comfortable about discussing personal problems, and then to get the other participants interested in helping to solve them in a sympathetic and practical way.

We will leave it to the imagination of the individual trainer to decide how such sessions should be run. However, there are a few key points which should be considered when structuring an advisory session —

- make the individual's problem everybody's problem;
- bring out success stories as well as failures;
- let the participants be the main actors, and do not impose your views or solutions on them;
- structure the session for maximum efficiency in solving the problems;
- consider the size of groups and the procedure to be followed for presenting, analysing and solving the problems;
- create an atmosphere where participants feel comfortable, free and secure.

COLLECTIVE ON-SITE ADVICE

It is difficult to give practical advice in a seminar on certain techniques, even if the actual situation is well documented by the participants. This calls for advice on site. Another reason for making on-site advice available is that sometimes a construction manager may not appreciate where practices are deficient, for example in supervising the labour force, and consequently would not be able to bring information to the clinic which revealed this particular deficiency. The only way for it to be identified is through a site visit.

Where professional advisers are not available, a possible model is to have participants from an area visit one another's sites.

Site visits will need close co-ordination by the trainer, and it is important that the participants are well motivated if they are to work. There are several ways in which they could be organised. The following example is a model for co-ordinating and carrying out site visits for a group of construction managers in Kuala Lumpur, Malaysia. It was designed in collaboration with the National Productivity Centre (NPC) in connection with a training programme on site productivity. In addition to advisory services, the site visits also provided a means of monitoring how the participants applied what they had learned on their projects.

example: The NPC monitoring and advisory guide

1. *Why monitor?*

- assess how participants implement their skills;
- evaluate how the implementation affects their projects;
- generate further improvement in skills among participants;
- enable the follow-up seminar to be structured to the needs of the participants;
- generate further case material.

2. *How should it be done?*

The participants form monitoring groups at the seminar. They take turns to visit one another's sites and

discuss productivity measures every two to three months. Each working group will be assisted by an NPC officer who will —

- arrange the time and place of each visit;
- observe and record the discussions and the recommendations during the visit;
- report back to the NPC programme co-ordinating officer.

3. *The site visit.*

This should be divided into two parts:

PART A: REVIEW

A review of how the participant has implemented measures and how they have affected project costs. It is expected that the NPC officer should take a leading role by co-ordinating the discussion, and recording what has been done, as well as the visitors' comments. The participants' action plans can be used as a basis for the review. Where possible, visual records in the form of slides or a video will be taken.

PART B: DISCUSSION

Discussion on how the site could be further improved. The NPC officer guides this discussion and takes notes for submission to the NPC programme co-ordinator.

4. *The role of the NPC officer.*

Apart from making arrangements and keeping records, this is primarily as a listener and catalyst for the discussions. The main transfer of knowledge and experience should be between the members of the working group.

monitoring and follow-up

PURPOSE

Not monitoring the effects of training is as pointless as repairing an engine according to a set of workshop manuals, but not bothering to check if it works. Surprisingly, monitoring is often overlooked with the result that ineffective training courses persist because nobody notices or nobody cares (apart from the unfortunate participants).

It is only by recording the effects of training that the trainer can progressively improve the content and methodology of the course.

PROVEN, TANGIBLE RESULTS

An additional practical argument for maintaining a monitoring system is that proven, tangible, recorded results are powerful advertisements for the training programme, both to those who fund the training and to potential participants. Here are some examples of how monitoring can generate publicity for a programme.

Contractor A, who is executing a project with a contract sum of NU50,000, was able to reduce the bricklaying time by 25 per cent by altering the positioning of the materials and introducing an improved method of transporting the bricks.

Contractor B improved his project by selecting the right number of workers for the different operations and giving them a certain time in which to complete the job. He showed the foreman how to plan the work. The foreman was also able to control the workers better after they were organised in smaller groups.

Contractor C won a contract worth NU115,000 by calculating a realistic tender which has been executed successfully. During the six-month contract period a regular workforce of 30-40 people was employed.

IMPROVED MOTIVATION

Most people perform better when their actions are monitored, so trainees are more likely to apply what they have learned if the training organisation checks subsequent performance and effects. In this way, a monitoring system will in itself provide gentle pressure on the participants to put into practice what they have learned.

For example, if a contractor learns an efficient technique of record-keeping, the incentive to apply it immediately may not be very great, because the potential benefits are long term and setting it up may seem too much trouble. In this case, the impending monitoring exercises might provide the push needed to overcome this inertia.

UNDERSTANDING THE PARTICIPANT

The success of any training comes down to the feeling of the individual trainee. Positive motivation is the key to success. One sign of a good trainer is an ability to understand the psychology of individual participants and take this into account in designing the training methodology and material. Maintaining a monitoring system is a way of showing the trainees that the benefits they derive from the training are important to the trainer. It furthermore confirms that the ultimate aim is a tangible improvement in performance rather than providing theoretical knowledge.

HOW TO MONITOR

The most accurate and reliable form of monitoring is for advisers or consultants to spend time with the participants and record their actions. Two main aspects should be recorded —

- how they apply the learned skills;
- what are the effects of the application, i.e. in terms of time and/or money saved.

Another way of monitoring is to use reports from the participants. This is a less expensive option, but inevitably less reliable. If such a system is used, efforts should be made to carry out spot checks to verify the accuracy of the information. If the system of self-monitoring is applied, it should preferably be backed by documentation. For example, a contractor who claims to have won a tender on realistic calculations learned at a tendering and estimating seminar should present the calculations to the trainer and explain what used to be done differently before the training took place.

USE OF ACTION PLANS

Monitoring and follow-up is easier when detailed action plans have been prepared by the participants at the end of a seminar or workshop. Care should be taken to ensure that the action plan is at the right level of detail and that it corresponds to the content of the training.

An action plan encourages the participants to commit themselves to carrying out certain measures when they are

back in their job. It is also helpful to them because it acts as a reminder of their intentions from the seminar. During the monitoring the action plan is a useful guide for the adviser or the trainer for comparing what has actually been done by the participants.

example: action plan for improving

site production methods

An example of an action plan for improving the efficiency of site production methods was used during a training programme on site productivity in Kuala Lumpur, Malaysia. Figure 21 shows the instructions given to participants, and figure 22 the standard form for use by participants.

Figure 21. Action plan for improving site production methods: Instructions to participants

**ACTION PLAN FOR IMPROVING SITE
PRODUCTION METHODS: INSTRUCTIONS
TO PARTICIPANTS**

A number of different site operations are listed below—

- concreting;
- formwork;
- bricklaying;
- materials transportation;
- steel-fixing;
- paving;
- excavation;
- supervision;
- safety;
- delivery of materials;
- use of equipment;
- location of temporary buildings;
- handling of materials.

Following discussion with other members of your group, describe the following:

Which operations would you select for improvement on your site? (Please limit yourself to three operations.)

For each operation you have selected, describe why you would select this particular operation?

For each operation, how would you describe and measure your performance?

Write your answers on the form (figure 22).

Figure 22. Action plan for improving site production methods:
Standard form for use by participants

ACTION PLAN FOR IMPROVING SITE PRODUCTION METHODS	
NAME:	COURSE No.
	DATE
OPERATION 1	DESCRIPTION
	REASON FOR SELECTION
	RECORDING METHOD
OPERATION 2	DESCRIPTION
	REASON FOR SELECTION
	RECORDING METHOD
OPERATION 3	DESCRIPTION
	REASON FOR SELECTION
	RECORDING METHOD

FOLLOW-UP

A typical programme structure contains training, then use of skills on the job and then follow-up. Parallel to this structure and subject to needs, one would run advisory services and workshops. A follow-up to the training would normally be in the form of a session where all the participants are gathered. It can be organised either to review the implementation of skill, to provide advice or to run additional training.

THE ILO INTERACTIVE

5

CONTRACTOR TRAINING

APPROACH

This chapter offers a brief introduction to the ILO Interactive Contractor Training (ICT) packages. These have been specifically prepared, tested and modified for use in training contractors in developing countries, and embody the ideas and approach set out in this guide. The broad target group are managers and owner-managers of small- and medium-scale construction enterprises, although much of the material could be adapted to train middle-level and junior managers in larger firms. The material is presented in a flexible modular format, so that it can be easily adapted to suit local conditions. We offer some advice on adapting the ICT modules, and this advice should be of general interest to trainers who are faced with adapting training material of various kinds to local circumstances.

THE ICT MODULES

Each module in the ICT series is devoted to a particular area of construction management which is relevant to the needs of contractors in developing countries. The first three modules¹ are as follows:

- Estimating and tendering.
- Project planning.
- Site productivity.

Further modules are in preparation, and the second set will cover —

- Contract finance.
- Contract procedures.
- Business finance.

ELEMENTS

Each module is divided into learning elements. For example, this is the content of the module on project planning —

ELEMENT 1	INTRODUCTION
ELEMENT 2	WHAT IS PLANNING?
ELEMENT 3	WHY PLAN?
ELEMENT 4	PREPARING A BAR CHART
ELEMENT 5	SHORT-TERM PROGRAMMES
ELEMENT 6	MATERIALS SCHEDULES
ELEMENT 7	RECORDING PROGRESS
ELEMENT 8	WHEN THE WORK DOES NOT GO AS PLANNED
ELEMENT 9	CASH FLOW ANALYSIS
ELEMENT 10	NETWORK ANALYSIS
ELEMENT 11	PUTTING THE PLAN INTO ACTION SIMULATION

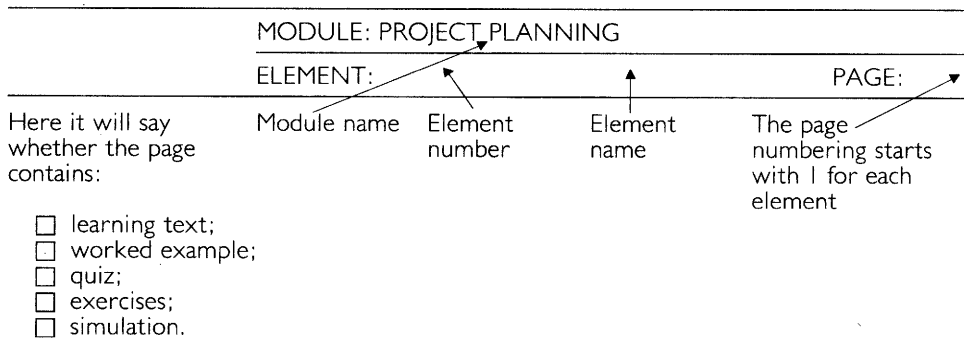
Each element of this module deals with a different aspect of planning and contains the necessary learning material and exercises. This means that the elements can be run independently, which offers considerable flexibility to the trainer when compiling a syllabus.

Other modules in the series are built up in a similar way. Hence a syllabus can be built up of elements from various modules in order to suit the exact training need of the participants.

PAGE LAYOUT

Each page in the module has the heading shown in figure 23.

Figure 23. Page layout for ICT modules



CONTENT OF ELEMENTS

The elements are divided into different parts as follows:

- learning text;
- worked example;
- exercises;
- quiz;
- simulation.

An element may contain any combination of these parts. Few elements in fact contain all of them. The parts all have different functions in the building of a skill. They are based on the assumption that to develop a managerial skill in a group of contractors, the following successive steps are necessary —

- learning the technique;
- learning how the technique is generally applied;
- learning how to apply it to solve their own problems.

It is important that trainers should regard the module not as a *finished* product but as a *starting point* for the preparation of the material to be used on the courses for which they are responsible.

The training needs analysis will have given the trainer a good indication of what should be included and in what form it should be presented.

example

The training needs analysis has indicated that the contractors generally prepare proper schedules for ordering building materials. This may lead the trainer to one of two conclusions —

- either* the inclusion of materials schedule preparation is a waste of valuable training time, in that it teaches the contractors something which they already know;
- or*, if the needs analysis revealed a need to learn a more sophisticated method of scheduling materials, orders and deliveries, the course content will need to be modified. In this case the modification will consist of adding a description of the more advanced technique, accompanied by examples and exercises related to local conditions.

WHAT TO CHANGE

The learning text, exercises, quizzes, worked examples and simulations will probably all need a certain amount of modification before the module is used in training.

As an *absolute minimum*, the following changes should be made:

- prices, wages, etc., should be changed into local currency. Information about the figures to be used can be obtained from contractors or suppliers;
- whenever examples of construction methods are given in the text, they should be checked to see whether they are representative of local practices. If they are not, they should be rewritten. This goes also for labour outputs used;
- management practices described in the module should be checked to see whether they are applicable locally. If not, they should be rewritten;
- drawings should be typical of the local situation, and if not, they should be redrawn;
- the module should be translated into the local language if necessary.

Beyond these minimum modifications, the trainer should change the content according to what has been revealed by the training needs analysis.

CHANGING THE LEARNING TEXT

Changes to the learning text will be based on the training needs analysis and the trainers' knowledge of the situation of the contractors. The following rules should be kept in mind when writing a learning text for contractors:

- keep it brief and concise;
- make use of illustrations and diagrams wherever these can explain an idea better than written words;
- use examples to illustrate the text whenever possible;
- use short sentences and simple language.

The ICT modules should serve as an example of how a learning text is written. However, there is always room for improvement. Besides, it is quite possible that a different style of writing is more appropriate in a certain country.

MODIFYING THE WORKED EXAMPLES

The worked examples in the module are likely to need modification to suit local productivity outputs, prices, construction methods and other practices. A worked example is best compiled by asking a competent contractor, consultant or engineer to work through it. The aim of the worked example is to show the participants how the construction management method described in the learning text is generally applied.

PREPARING EXERCISES

The exercises should reinforce important parts of the learning text by having the participants answer questions or do calculations. Once the problem areas to be covered by the exercises have been selected, it is important to aim them at the right level of difficulty. This can be determined by testing the exercises on selected individual contractors before the training material is completed.

DEVISING QUIZZES

The questions in the quiz need to fulfil the following criteria:

- they must reflect the content of the learning text, so that if the learning text is changed, the quiz may have to be changed too;
- there is one single, correct answer to each question;
- they must be aimed at the right level of difficulty.

WRITING SIMULATIONS

The reader will remember that the function of a simulation is to enable the participants to learn how to apply the skill to their own situation. This is a crucial element in the learning process and due attention must be paid to it.

A simulation is a model of a real situation. On to this situation are imposed problems which the participants solve, using their acquired skill. By using what they have learned from the theory and the discussion with fellow-participants in the classroom, they learn before leaving the course how to tackle the various situations that they will face when they get back to their jobs.

The trainer may modify the simulation in the ILO material or alternatively choose to compile a completely different one. There may be a need to change the content of the simulation altogether, especially if the content of the rest of the module has changed greatly.

Whether the trainer chooses to build on the existing simulation or compile a fresh one, the following are some useful rules that can be applied.

1. *Select the theme.*

The theme should reflect as far as possible the content of the training material. It should include the parts of the theory which are to be transformed into a skill for the contractors to use when they return to their jobs.

2. *Observe and collect the data.*

Use may be made of the experience of helpful contractors who can provide realistic data for the simulation. For example, the simulation is to be a tendering exercise, where the participants prepare a tender for a real housing project. What is needed are technical data about the buildings, realistic data on a contracting company's overheads, materials prices, wages, number of supervisors, and so on. The quantity of data is important. Too little data in the simulation may eliminate important considerations when solving it. Too much data may make it confusing for the participants. Select the data which are relevant, no more and no less.

3. *Determine the problems.*

The real-life situation of a contractor is full of problems to be tackled, so this must also be reflected in the simulation. Typical problems may be delayed payments from clients and delays in certain operations. Such typical problems will have been revealed in the training needs analysis. When data are collected for the simulation, the contractors can also be asked to describe the customary nature and extent of certain problems.

4. *Write the simulation.*

Once the theme has been selected, data collected and a decision taken on which problems to introduce, the simulation needs to be presented in a form which is clear and logical. Simple language and short sentences

should be used, and the simulation divided into two parts:

- the narrative, giving the relevant data and the problems of the situation;
- the questions which the participants are to answer.

Note

¹These are available as a complete set from ILO Publications, International Labour Office, CH-1211 Geneva 22, Switzerland.

One of the central themes of this guide has been the need for care and forethought in the development of construction management training programmes. We have deliberately not offered definitive answers. Indeed it is our thesis that definitive answers do not exist. Instead, decisions must be made in each country according to an assessment of local demand and according to the level of development already achieved in the domestic contracting sector.

The increasing interest in the sector is well justified, since not only is it a significant source of direct employment but it also contributes through its wide range of operations and projects to the growth and development of virtually all other economic sectors. Increasing the degree of self-reliance in construction and improving the effectiveness of construction operations are linked objectives. This means, *inter alia*, maximising local employment at construction sites; enhancing the role of national professional staff in the design, planning and management of new projects; expanding the production of appropriate locally manufactured construction materials; and increasing the share of domestic construction work undertaken by national contractors.

The ILO is involved in sectoral studies, institution building, technical and managerial training, trainers' and consultants' development, information services and other activities aimed at achieving these objectives. Thus, although it is the topic of contractor development through training in management skills that has been the focus of this volume, we recognise that training courses are often most effective when set in the context of integrated construction industry development programmes.

In regional terms, it is in Africa particularly that there is a pressing need for the development of effective national building and civil engineering contractors. In many countries throughout the continent, the domestic

construction sector has remained relatively weak over the years. As a result a pattern has been established in which there are often deep and extensive incursions into the contracting market by large companies of expatriate origin and by firms relying heavily on foreign expertise and financial backing. Meanwhile, little or nothing has been done to foster the growth of vigorous and efficient domestic capabilities.

Although in Asia the influence on smaller contractors of large companies of expatriate origin is less marked, the domestic construction industries are also relatively weak. Their need for upgrading is as great if they are to achieve their full potential contribution to the national economy.

The key issue, then, is one of relating contractor training programmes to individual national circumstances and priorities. And it is here also that the ILO can continue to play a role by providing technical advice in suggesting how this guide can be applied and implemented. We hope that both the guide and the Interactive Contractor Training (ICT) series of training modules reach, and help, a wide audience of trainers and training managers. But we recognise that neither the guide nor the ICT modules are likely to be sufficient in themselves, and the ILO is therefore ready to offer practical technical assistance in developing tailor-made training programmes to suit local institutions and local needs, including the training of teachers to enable them to achieve optimum performance. In doing so, the ILO is able to draw not only on its own staff resources but on the group of construction industry experts who have already contributed to the preparation of the guide.