

Technical Brief No.53: Training

Water and sanitation facilities will only be sustainable if there are enough competent people to plan, construct, operate, maintain and manage them. Training is a critical factor; this technical brief looks at key elements in its effective provision.

What is training?

Training is the systematic development of knowledge, skills and attitudes (KSA) required to work effectively. Training aims to change behaviour. It is an agent of change.

For example, water-supply operators with limited skills and knowledge in water treatment can, through training, be made aware of the importance of variations in raw-water quality, and become motivated and skilled to act to ensure the supply of safe drinking-water.

The training process

Knowledge and skill on their own will not lead to changed behaviour unless accompanied by motivation and a supportive environment.

Responsibility for the effectiveness of training is shared by the individual, the organization, and the trainers. The term 'organization' can be interpreted broadly, e.g. a government department, an aid agency, or a community management structure.

The individual

- needs motivation and the ability to take advantage of training

The organization

- ensures training matches needs
- provides suitable climate to motivate trainee
- ensures conditions exist to utilize newly acquired knowledge and skills

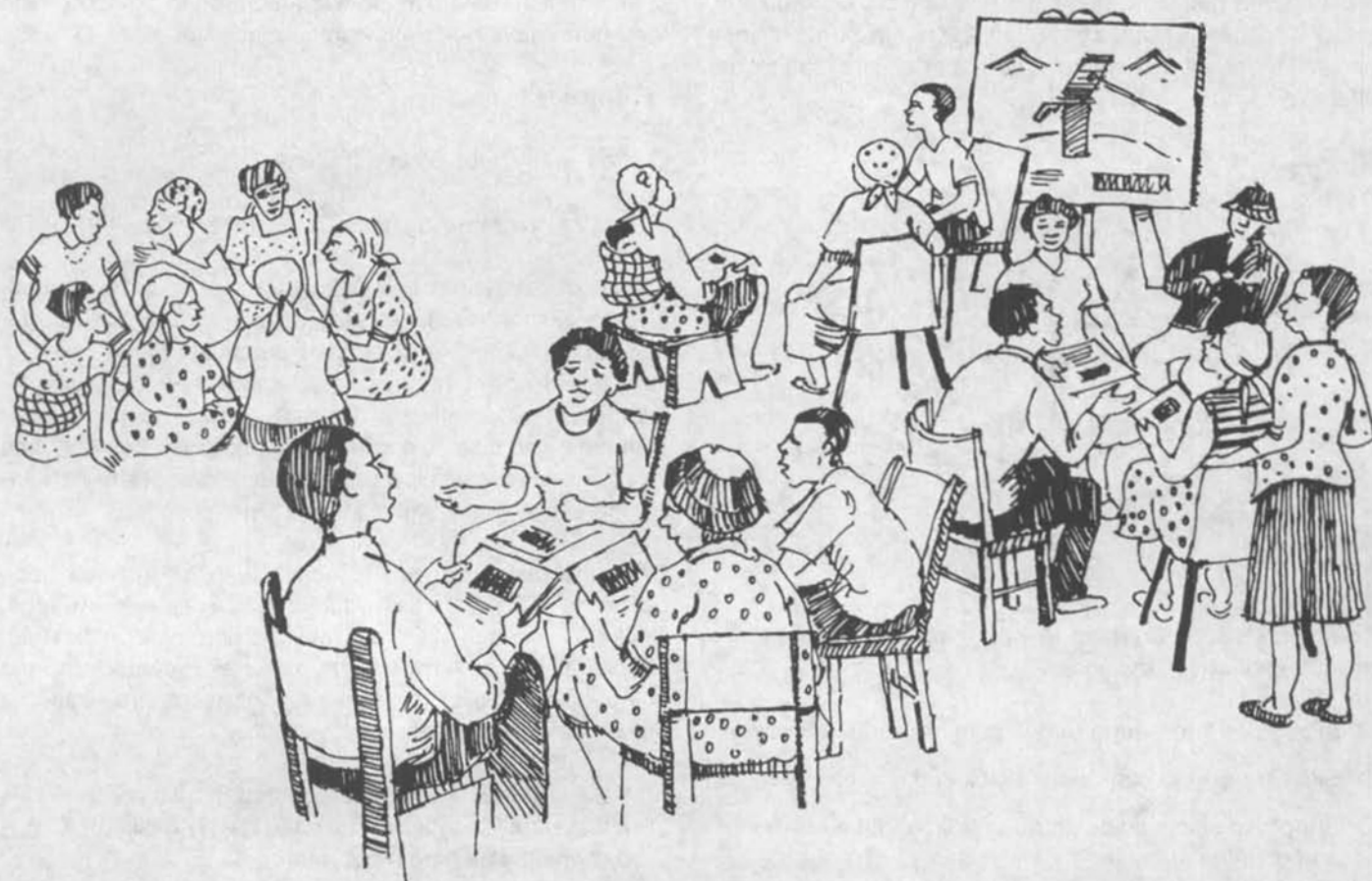
The trainers

- provide the opportunities for learning to take place

Trainers may be from within the organization or from an external agency. They may not be designated 'trainers' within an organization, but could be managers with motivation and enthusiasm to promote learning.

Training is not an isolated activity

Training is not an isolated activity of instruction. It should be a cyclical process with distinct stages, as shown overleaf.



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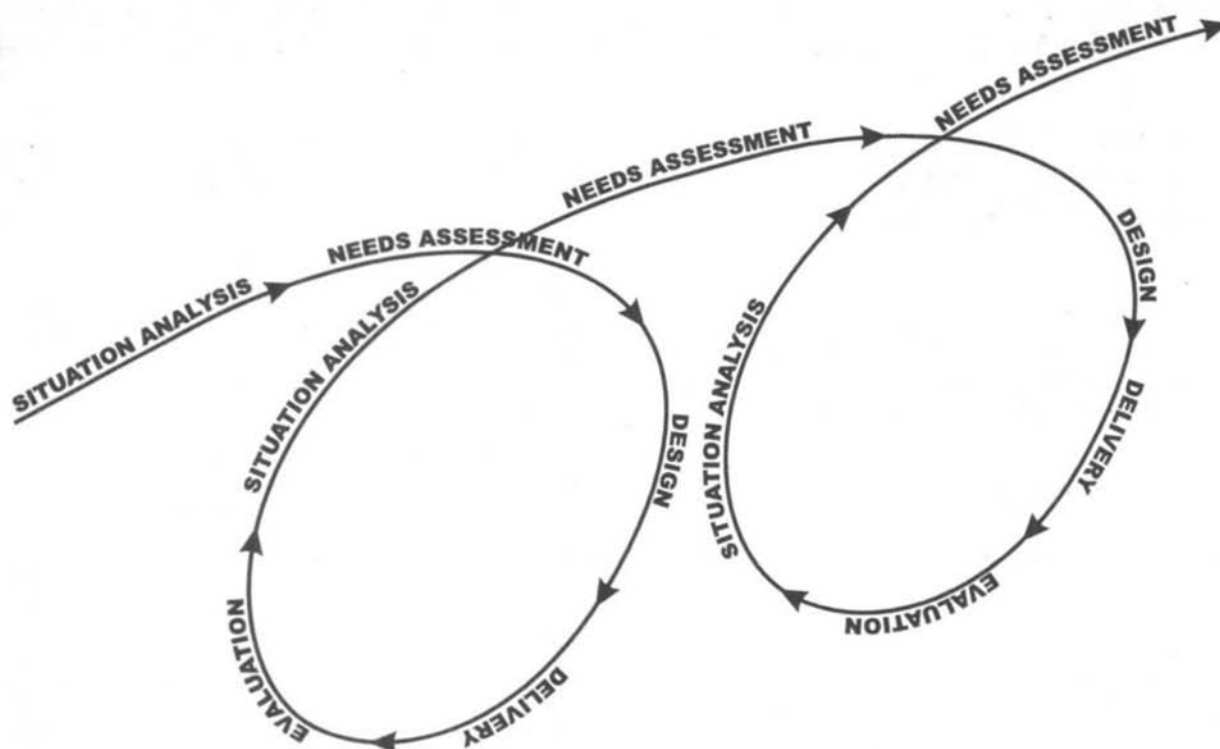


Figure 1. The Training Cycle

Situation analysis

Training should not be for training's sake. There should be clearly identified reasons for training, based on an analysis of a community's or an organization's situation. Do problems exist? Can they be solved by training? A pump caretaker may be well-trained but, without spare parts, she cannot be effective.



Common problems related to work performance, and how training might help, include:

- Increasing knowledge to overcome misunderstandings
- Skills training to overcome a lack in this area
- Supporting individuals, through training, to motivate and develop attitudes

Training-needs assessment

Training should be based on clearly identified needs. Training-needs assessment involves the collection and analysis of information related to the work required to be done. With this information, decisions can be made on:

- *who* needs training
- *how many* people need training
- *what kind* of training is required and to what standard

Assumptions based on occupational labels should be avoided. It is necessary to establish the actual work required to be done in each situation. The label 'pipefitter', for example, is very broad and it may be misleading because it can be interpreted differently by different people. Is a pipefitter someone who installs domestic plumbing or someone who lays large-bore main pipelines? An assessment should identify the actual work involved in the pipefitter's job.

Once the tasks required to accomplish a job have been determined, compare the requirements with the knowledge, skills and attitudes of the available personnel. You can then identify any gaps between the attributes required and the competence of existing personnel. There are three possible outcomes of this assessment:

- If the gaps can be eliminated through training, the assessment results can be used as the basis for designing a training programme.

Waterlines Readers' Survey 1997



The newspaper proprietor's cry of 'Give 'em what they want!' still holds true for any successful publication. So, here's your chance to tell us exactly what you think of *Waterlines*. What do you like? What would you prefer to see less of? What important area of water supply and sanitation in the South has bypassed us entirely? Your answers will help us to improve *Waterlines* and plan for the future, so that you can get more out of it.

Every survey that is returned — and photocopies are welcome too — will be entered into a draw. One reader will receive a £50 book token to spend on titles listed in the IT Publications mail-order catalogue *Books by Post*, and five other readers will receive a free one-year subscription to *Waterlines*.

Thank you very much for your help and co-operation — it helps us a great deal.

The Editor

You may, of course, reply anonymously, but if you would like to enter the draw, please fill in your details below.

Name:

Address:

Do you know of anyone who you think would like to receive *Waterlines* but who does not? As an existing subscriber, you can give them a subscription for only £12/\$20 (a discount of 25%) **using this form**. If you do not wish to pay their subscription but think they might like to take one out themselves, tell us their name(s) and we'll send them a sample copy and a subscription form.

Name:

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☐ Please invoice me for this subscription at £12/\$20 ☐ £18/\$32 for airmail ☐ Please send the above a sample copy

About the journal

1. On average, what proportion of each issue of *Waterlines* is of interest to you?

- | | |
|---|---|
| <input type="checkbox"/> All of it | <input type="checkbox"/> Less than half of it |
| <input type="checkbox"/> Most of it | <input type="checkbox"/> Very little of it |
| <input type="checkbox"/> About half of it | <input type="checkbox"/> None of it |

2. For how long have you subscribed to *Waterlines* (In years)?

3. How did you find out about *Waterlines*?

- | | |
|--|---|
| <input type="checkbox"/> Through a friend or relative | <input type="checkbox"/> Through a colleague/work |
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| <input type="checkbox"/> Through a leaflet or advertisement (please specify) | <input type="checkbox"/> Other (please specify) |

4. Who paid for you to receive this copy of *Waterlines*?

- | | |
|---|--|
| <input type="checkbox"/> Yourself | <input type="checkbox"/> The organization you work for |
| <input type="checkbox"/> Another organization | <input type="checkbox"/> Other |

5. If you are not paying for your own subscription, could you?

- ☐ Yes ☐ No, I cannot afford it ☐ No, I have no access to foreign exchange

6. What 'value for money' do you think *Waterlines* provides? (please circle)

Very good Good Reasonable Poor

7. How many people read your copy of *Waterlines*, including yourself?

- | | |
|--------------------------------|--|
| <input type="checkbox"/> One | <input type="checkbox"/> Six to ten |
| <input type="checkbox"/> Two | <input type="checkbox"/> Ten to fifteen |
| <input type="checkbox"/> Three | <input type="checkbox"/> Sixteen or more |
| <input type="checkbox"/> Four | <input type="checkbox"/> Other |
| <input type="checkbox"/> Five | <input type="checkbox"/> Do not know |

8. Which of the following are reasons why you read *Waterlines*? (Number in order of priority)

- ☐ To keep up with developments in the water and sanitation sector?
- ☐ To read case studies on appropriate, low-cost technologies?
- ☐ For practical tips which you can use in your work?
- ☐ To what extent is the journal useful for each of these?

9(a) What other journals, magazines, and newspapers do you read regularly (professional)?

.....
.....

9(b) Which other journals, magazines, and newspapers do you read regularly (leisure)?

.....
.....

10. Where do you get most of your information on water and sanitation issues:

- (a) in general?
- (b) affecting the South?

11. Do you think the writing style of the journal:

- ☐ is about right
- ☐ should be written in a more direct, accessible (less academic) style
- ☐ should be more academic in tone

12. Do you think the current layout:

- ☐ is appropriate to the contents
- ☐ should be broken up more (with bullet points/panels etc)
- ☐ contains too many photographs/drawings
- ☐ contains too few photographs/drawings

13. What do you think about the length of the articles (currently 2000 - 2500 words)?

- ☐ should be more variety — some short pieces, plus longer articles
- ☐ length is about right
- ☐ too long
- ☐ too short

14. Have you ever used a copy of *Waterlines*, or a particular article, in your work? In what way? (Tick as many boxes as apply)

Occasionally Regularly

- | | | |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | Have used a copy of <i>Waterlines</i> to support my work |
| <input type="checkbox"/> | <input type="checkbox"/> | Quoted from <i>Waterlines</i> in a paper or talk |
| <input type="checkbox"/> | <input type="checkbox"/> | Copied an article(s) to circulate to colleagues/ students |
| <input type="checkbox"/> | <input type="checkbox"/> | Used an article in discussion with other development workers |
| <input type="checkbox"/> | <input type="checkbox"/> | Used technical information to make or adapt a piece of technology |
| <input type="checkbox"/> | <input type="checkbox"/> | Used technical information in my business |
| <input type="checkbox"/> | <input type="checkbox"/> | Reprinted an article, extract, or news item in another publication |

15. We try to include a mix of articles covering both the technical and the social aspects of appropriate water supply and sanitation. Do you think we are getting the mix right? (please circle one answer)

- | | | |
|----------------------------------|-----|----|
| The mix is right | Yes | No |
| Too many technical articles | Yes | No |
| Too many social science articles | Yes | No |

16. Each issue of *Waterlines* has a 'theme'. How do you rate the themes that we have covered in the last two years, and have you used them in your work?

	Used in work	Very interesting	Somewhat interesting	Not at all interesting
Drinking-water quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Still a lot to learn — capacity building in the water sector	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Upgrading Africa's traditional water sources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Communities — carrying the can	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
With no time to spare — standards, skills and solutions for emergency sanitation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tales of ingenuity and persistence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

17. Which individual article(s) did you like most? (please specify)

.....
.....

CAPACITY BUILDING

Africa's water companies unite: A useful, utility partnership. Mohammed Fouad Djerrari and Jan G. Janssens 15(4)
Gravity-flow water-supply system, Hitosa's large-scale: Mandate to manage. Keith Wright 15(2)
Institution building in Sri Lanka: Turning around an organization.. M. Wickramage 15(4)
Integrated river management, The long road to: Rejuvenating the Rhine. Pieter Huisman, Koos Wieriks and Joost de Jong 15(4)
Knowledge is more valuable than gifts, Why: The researchers. Eveline Bolt, Norah Espejo, and Marc Lammerink 15(2)
Microfinancing South Africa's water supply and sanitation: Banking on the poor. Frank Hartvelt and Anton B. Deiters 15(4)
NGO/government partnership in Tanzania: Collaboration or collision course? Julie Jarman and Catherine Johnson 15(2)
Philippines International Training Network, The: Why networking works. Rosario Villaluna 15(4)
'Project' approach, Beyond the: Capacity building. Guy Alverts, Frank Hartvelt, Jeroen Warner 15(4)
Rural demand management: local need, local potential. L. Abrams and J. Warner 15(4)
Training environment, Building capacity in the: Coping with the brain drain. Maarten Blokland and Jeroen Warner 15(4)
Water-supply technology for Southern KwaZulu Natal, Choosing the right: The spring-box solution. Antony Lenehan 15(2)
West Bank's aquifers, Joint management of the: A win-win option. Eran Feitelson 15(4)

COMMUNITY PROJECTS/ PARTICIPATION

Buying into rural water supply. Michael Wood and Negash Dhinna 14(4)
NGO/government partnership in Tanzania: Collaboration or collision course? Julie Jarman and Catherine Johnson 15(2)
Compost toilet, Kerala's: Seeing (but not smelling) is believing. Paul Calvert 15(3)
Contracting NGOs to implement rural water and sanitation projects in Bolivia. Andrew W. Karp 11(1)
Governments and communities re-examine roles: Lasting solutions. Dave Mather 15(2)
Knowledge is more valuable than gifts, Why: The researchers. Eveline Bolt, Norah Espejo, and Marc Lammerink 15(2)
Listening, Lesson in. S. Melchior-Tellier 11(2)
Gravity-flow water-supply system, Hitosa's large-scale: A mandate to manage. Keith Wright 15(2)
People are at the heart of sanitation. Dick de Jong 14(3)
Local democracy and development in Andhra Pradesh: The people's machinery. S. Paramasivan 15(2)
Rural demand management: local need, local potential. Len Abrams, Jeroen Warner 15(4)
Sanitation and hygiene understanding. Water. T. Brief 51 15(3)
Shallow wells, Zimbabwe's: building on tradition. Nason Mtakwa, Ephraim Chimunde 15(3)
Slum water supply for squatters, Securing a: Can pay, will pay. Dibalok Singha 15(2)
Uganda: keeping a country clean through its schools and communities. Regina C. Faul-Doyle and Brendan A. Doyle 15(1)
Who cares about water? J.O. Drangert, 13(3)

EDUCATION & TRAINING

Community-managed water supply in the new South Africa, Technology choices for:

Greater expectations. M. Rall, J. de Jager 15(3)
Development theatre for water and sanitation: clean up your act. L. Levert 14(1)
Environmental education, effective: constraints and prerequisites. K. Krishna Mohan and D.L. Saywell 13(2)
Governments and communities re-examine roles: Lasting solutions. Dave Mather 15(2)
Gravity-flow water-supply system, Hitosa's large-scale: A mandate to manage. Keith Wright 15(2)
Knowledge is more valuable than gifts, Why: The researchers. Eveline Bolt, Norah Espejo, and Marc Lammerink 15(2)
NGO/government partnership in Tanzania: Collaboration or collision course? Julie Jarman and Catherine Johnson 15(2)
Participatory learning for water and sanitation. John Hubley 12(3)
Relief-workers, Finding and training: Being prepared. Bobby Lambert 15(1)
Sanitation and hygiene understanding. Water. T. Brief 51 15(3)
Water-borne disease, A practical approach to combating: Sunshine and fresh air. Rob Reed 15(4)
Training challenge, Three creative solutions to the. M. Blokland and H. Savenije 15(4)
Training environment, Building capacity in the: Coping with the brain drain. Maarten Blokland and Jeroen Warner 15(4)
Training female sanitation volunteers. Joy Morgan 11(2)
Uganda: keeping a country clean through its schools and communities. Regina C. Faul-Doyle and Brendan A. Doyle 15(1)

EMERGENCY MEASURES

Burmese refugees, an engineering response to the needs of. Martin Gambrell 13(1)
Cholera, environmental sanitation for the control of in Lusungwi Refugee Camp, Malawi. F. Mulemba, P. Nabeth 12(4)
Engineers, humanitarian relief, and water supplies. Bobby Lambert 13(1)
Excreta disposal in emergency situations, Effective: Rethinking the unthinkable. Jim Howard 15(1)
Vector control in emergencies: Missed opportunities cost lives. M. Thomson 15(1)
Emergency sanitation and water-supply programmes, Guidelines for: More than navel-gazing. John Adams 15(1)
Pit latrines in Nepal: the refugee dimension. Jonathan Puddifoot 14(2)
Public-health learning experience, A: Oxfam in Goma. S. McKenzie, R. de la Haye. 15(1)
Refugees, emergency sanitation for. T. Brief 38 12(2)
Sarajevo, Water for. Jo Parker 13(1)
Relief-workers, Finding and training: Being prepared. Bobby Lambert 15(1)
UNICEF upward-flow water filter, a performance evaluation and modification of the. V. P. Singh and M. Chaudhuri 12(2)
Water supply, emergency. T. Brief 44 13(4)

EVALUATION

Colombia's low-income settlements, sanitation in: selection, implementation, evaluation. I. R. Tarquino, M. E. Ince 13(2)
Drinking-water quality monitoring and Ecuador, an honest evaluation of water and sanitation in: out of the mouths of babes. J. T. Visscher, M. Garcia, C. Madera, A. Benavides, and E. Quiroga 14(3)
Indicators for sanitation: yardsticks for cleanliness? A. Almedom and Ashoke Chatterjee 13(3)
Inter-agency guidelines for M&E, Always room for improvement? Tom de Veer 15(1)
Knowledge is more valuable than gifts, Why: The researchers. Eveline Bolt, Norah Espejo, and Marc Lammerink 15(2)
Pollution-risk assessment by field staff:

where there is no training. Guy Howard and Alice Simonds 14(1)
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Sanitary surveying. T. Brief 50 15(2)
Sustainability in the water sector, measuring. Joanne Hammel and Sally Sutton 12(1)

FINANCE & COST RECOVERY

Community self-financing of water and sanitation systems. B. Rahardjo, D. O'Brien 12(3)
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Southern Africa, Costs, management and maintenance in: Whose water supply? Paul Taylor 15(3)
Upgrading Botswana's rainwater catchment: Catching up. John Gould 15(3)

GROUNDWATER/WELLS/ BOREHOLES

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Development and the environment. Ron Bannerman 11(3)
Drilling, simple methods. T. Brief 43 13(3)
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Water-supply technology for Southern KwaZulu Natal, Choosing the right: The spring-box solution. Antony Lenehan 15(2)
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Springs, protecting: an alternative to spring boxes. T. Brief 34 11(2)
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Upgraded family well programmes, Zimbabwe's: now in my backyard. P. Morgan, E. Chimunde, N. Mtakwa, and A. Waterkeyn 14(4)
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.....

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- If the gaps are great, then it may be necessary to recruit new, trained and competent staff.
- In some cases, where neither of the above options is feasible, it may be necessary to re-assess the broader strategy — for example, if the technology chosen is appropriate to local circumstances.

Time, funds and expertise may restrict the depth and detail of analysis. It is unusual to 'get it absolutely right' first time. So take a staged approach. Carry out a needs assessment, do some training, evaluate its effectiveness, assess needs again and further develop the training.

Training design

The training-needs assessment is used to establish aims and objectives based on the identified gaps in knowledge, skills and attitudes.

- An aim is an overall goal or statement of intent, for example, to increase the effectiveness of community water managers.
- General objectives describe what someone should know, understand, or appreciate at the end of a training session.
- Specific objectives clearly identify what participants will be able to do as an outcome of a training activity. For example, 'at the end of the session, participants will be able to assemble correctly a centrifugal pump'. Specific objectives are used to assess participants' performance: can they or can they not assemble a centrifugal pump?

A training session is designed around a general objective and a series of specific objectives.

Training methods

I hear, I forget
I see, I remember
I do, I understand

Chinese proverb

Participatory methods of training — in which people communicate with each other and learn by doing — are likely to be much more effective than one-way lecturing. Here is a selection of participatory training methods:

- *Buzz groups* — discussion in small groups on a particular topic, allowing everyone to be involved. Findings can be reported back to the whole group.
- *Brainstorming* — quickly generates ideas and responses which can be discussed after the brainstorm.
- *Case study* — trainer's presentation of an event or situation which participants discussed afterwards.
- *Role play* — participants act out a real-life situation, sometimes taking on an unfamiliar role.

- *Simulation* — a combination of case study and role play in which participants take on roles within a given scenario. Participants learn through their experience and analysis of the situation. De-briefing is an important part of the process.
- *Demonstration and practice* — participants observe a practical demonstration and then practise under close supervision.

Where and when should training take place?

Venue and timing can be crucial. Training in the workplace has its advantages:

- no trainee concerns about the expense, effort and time in travelling
- training specific to the circumstances of the trainees
- performance can be assessed in the work situation

But training in the workplace can also be distracting. A venue remote from the work environment allows participants to focus fully on the training, and share experiences with people from other organizations. Sharing experience, and establishing contacts and networks is an important aspect of training.

The importance of timing will vary but it must suit the participants if they are to attend and concentrate.

Who will do the training?

Competent individuals are often recruited from within an organization or community and trained as trainers. External agencies with experienced trainers may be required to assist in the development of training skills.

Training delivery

Training is 'delivered' through training sessions, courses and programmes. The manner of delivery can determine effectiveness. Trainees need to be relaxed and open to participation. This means avoiding a top-down 'expert' approach. A trainer is a facilitator of learning, providing opportunities for participants to learn through experience, and to grow in confidence.

People are individuals, and learn individually, even in a group. To support each individual, a trainer needs to establish a rapport by:

- having a genuine interest in each trainee
- encouraging and enthusing
- involving everyone (trainers and trainees)
- ensuring that s/he can be clearly understood by everyone



Technical Brief No.53: Training

Training-course evaluation

The trainees, trainers, and managers all want to know if the training has been effective:

- were the objectives of filling the gaps in knowledge, skills and attitudes achieved?
- were participants satisfied with the training?
- was the training cost-effective?

There are several ways of assessing effectiveness, and a combination of methods may be used:

- questionnaires
- trainee presentations
- practical demonstrations

Impact evaluation

The final test of the effectiveness of training is whether what has been learned is applied in practice. To evaluate impact:

- assess work performance before training
- assess work performance after training

Information collected at the training-needs assessment stage, before training, can be useful at the evaluation stage.

The training process is not static. It should be one of continuous development. Situations change, and training itself is an agent of change. Evaluation results feed into the design of future training and so the training cycle continues.

On-the-job training

On-the-job training often relies on the assumed abilities of those involved in the hope that learning will take place, but with little thought given to how this should happen. In this situation the trainee is as likely to learn bad as good habits; the training must be planned.

Coaching is one method of planned on-the-job training. The trained coach (supervisor or counterpart) sets tasks and assignments, monitors progress, assesses performance and gives feedback. This is done within a planned framework.



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