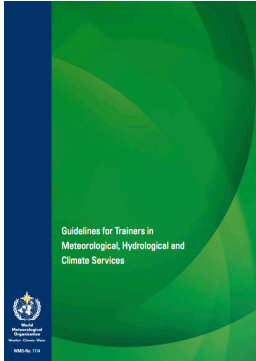


Chapter 5: Learning Solutions



NOTE: This is an extract of the document “Guidelines for Trainers in Meteorological, Hydrological and Climate Services” (WMO-No. 1114).

To read the full document, please access:

[WMO-No 1114](http://www.wmo.int/pages/prog/dra/documents/wmo_1114_en.pdf)

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5. LEARNING SOLUTIONS

Competence III: Determine a learning solution

Competency description

The learning solution is determined and a plan is prepared for implementing the chosen solution.

Performance criteria

- Assess learning solutions in terms of costs, organizational and audience characteristics, resource implications and the extent to which they satisfy all the required learning outcomes;
- Choose a learning solution that meets requirements and fits constraints;
- Consider a wide range of potential solutions, including using a mixture of formal, semi-formal and informal learning methods;
- Prepare a plan to implement the chosen solution, including timeframe, costs, location and technology, personnel, targeted learners and evaluation criteria.

Knowledge requirements

To be able to understand, explain and/or critically evaluate:

- How the nature of the learning outcomes and organizational requirements help determine a learning solution;
- Types of formal, semi-formal and informal learning methods that might form part of a learning solution;
- Strengths, weaknesses and appropriate uses of learning methods that are parts of a learning solution;
- Key components of an implementation plan.

Personnel who should demonstrate this competency

- Senior trainers;
- Instructional designers or other education specialists;
- Trainers who would benefit from an awareness of different learning solutions and the factors taken into account in choosing those solutions.

5.1 Introduction

Having identified and assessed learning needs, the next step is to decide how to satisfy them. There are many factors and many possible solutions to take into account in this process. In this chapter, we use the term “learning solution” to describe the mode of training delivery and its general structure. In the next chapter, we will discuss the design of learning activities and resources, which are the components of a solution.

Learning solutions tend to fall into three broad categories:

- *Informal learning*: learning embedded in activities not explicitly designated as part of a learning programme, so there are no specified learning outcomes. The learning is unstructured and often experiential, and is acquired by interacting with colleagues, undertaking self-study and performing tasks that serve to develop expertise. Trainers, coaches or mentors are not involved;
- *Semi-formal learning*: learning associated with ongoing activities with specified learning outcomes, but which also encourage and support learning that might go beyond the specified outcomes. Trainers are not usually directly involved, but interactions with coaches or mentors might contribute;
- *Formal learning*: learning based on a structured programme of study, which is explicitly designated as learning and has well-defined learning outcomes. The learning is acquired through, for example, participation in courses and workshops. Formal learning is usually trainer-led.

Michael Lombardo and Robert Eichinger³ have suggested that for the development of leadership and management skills the learning components should be in the following proportion: 70% (informal), 20% (semi-formal) and 10% (formal) – this is sometimes called the 70:20:10 framework.

The 70:20:10 proportions are not prescriptive, but provide a useful framework when planning a comprehensive learning solution. It is important to remember the significant role that experiential learning (informal and semi-formal) can play. However, the proportions will depend on the individuals involved, the area of expertise being developed and the organizational learning policy.

This model should not be interpreted as indicating that learning through formal processes is unimportant. Experiential learning and self-study is only effective if it is underpinned by well-structured development of knowledge and understanding, so formal learning plays a critical role, even if learners spend less time engaged in it.

A training department should encourage and support informal and semi-formal learning as well as running formal courses. Ideally all three types of learning should be integrated into a comprehensive learning process. This means that the training department might need to guide line managers in developing strategies to facilitate experiential learning. It is likely, however, that many training departments will be mainly concerned with formal learning, perhaps with some aspects of semi-formal learning also falling within their remit.

Figure 5.1 identifies the most commonly used formal and semi-formal learning activities. Later these will be considered in more detail.

The choice of the learning solution should be guided by the organizational context and learning needs as described in Chapters 3 and 4. At times, it might be necessary to reconsider the learning needs and priorities once the resource requirements for implementing the best learning solution have been identified.

5.2 Considerations for determining learning solutions

There can be a variety of root causes of a performance gap. These can be grouped into three broad categories (see Figure 5.2):

- *Lack of competence*: for example, a forecaster might not know how to make full use of new NWP products or data from a new observing system (this could be addressed by formal or semi-formal training);

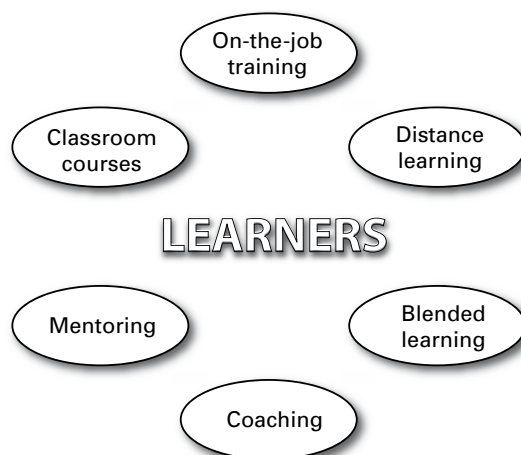


Figure 5.1. The most common formal and semi-formal learning methods

³ Lombardo M. and R. Eichinger, 2010: *The Career Architect Development Planner*. Fifth edition. Minneapolis, Minnesota, USA, Lominger International.

- *Lack of motivation*: for example, someone could be demotivated because of concerns about career progress or uncertainty about the future (best addressed by the line manager who can understand the cause of the problem and work with the individual to find a solution);
- *Lack of environmental support*: for example, the procedures and production facilities for providing forecasting services are cumbersome and could lead to mistakes (the best solution is to redesign the procedures and production facilities).

Because training mainly addresses a lack of competence, that will now be the focus.

Normally, the prioritization of learning needs will have been addressed as part of the learning needs analysis. If that is not the case, a key consideration would be the extent to which addressing the learning needs contributes to the success of the NMHS and timely action. Furthermore, NMHSs have their own policies about how individuals gain access to learning opportunities and these policies have to be considered along with the learning culture within the NMHS.

A key consideration in determining appropriate learning solutions is the nature of the intended learning outcomes. The following gives some examples:

- If the outcome is one that a learner can demonstrate only by using task-specific technologies, such as setting up and repairing an observing station, then more direct, hands-on learning solutions are called for, under the guidance of a trainer if the task is sufficiently complex (for example, in a classroom with laboratory facilities or through on-the-job training or job aids);
- If the outcome requires the use of cognitive skills in easily replicated conditions, such as cloud identification using satellite imagery, a much wider variety of solutions are available, including classroom courses and self-paced online learning modules;
- If the outcome requires complex decision-making based upon a large number of data sources, such as generating a weather forecast, a wide range of solutions are available, but they require a level of interaction and feedback that can be offered best through trainer-led classroom learning, synchronous distance learning, or on-the-job training and mentoring;
- If the outcome is acquisition of information, such as understanding a new policy or procedural change, learning solutions might include less complex choices such as a short lecture or written documentation.

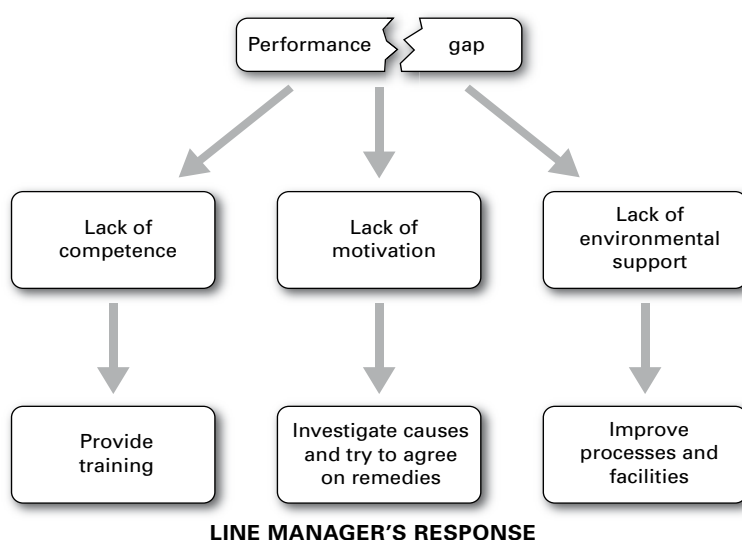


Figure 5.2. Ways in which a line manager can take action to address a gap in job performance.

In addition to the intended learning outcomes, there are a variety of other considerations to bear in mind when choosing learning solutions:

- *Are the required resources available?* There might be a capped budget for learning opportunities which will limit options for solutions. Moreover, if the training is to be delivered in-house, the availability of suitable facilities and trainers will also have to be taken into account;
- *Can the people with the learning needs be released?* This is an issue particularly for operational staff. Not only will their participation put pressure on their colleagues (unless the staffing arrangements have taken the need for professional development into account), but operational staff might also be based at stations far from the training facilities. Operational managers need to judge whether everyone can participate at the same time or staggering is required, or whether distance learning is an option;
- *How critical is it to meet the learning needs quickly and effectively?* The cost of not providing the training should also be considered, and is typically framed from an organizational risk perspective;
- *What are the characteristics of the learners?* A group of people might have similar learning needs, but the depth and range of prior learning and experience may vary. For example, a formal course might suit novice forecasters, whereas a less formal workshop or self-study might be better for highly experienced forecasters;
- *How will the success of the learning solution be evaluated?* This can determine how the solution is implemented and also, to a degree, the choice of the solution.

The rest of this chapter will focus on options for learning solutions, with a distinction being made between formal, semi-formal and informal learning.

5.3 **Formal learning**

Formal learning usually refers to what occurs in a classroom with a trainer, though this can include, besides lectures, other activities such as exercises, case studies, simulations, practicals and projects. Nowadays, however, distance learning can make an important contribution, even without face-to-face or live interaction with a trainer. Rather than classroom versus distance learning, a more useful distinction is between trainer-led learning (in the classroom or at a distance, in synchronous or asynchronous mode) and self-paced or self-directed learning.

5.3.1 **Classroom (face-to-face) courses**

A classroom course can be used to develop the skills or knowledge of a group of people with similar learning needs. Though this can be an efficient way of using resources when the learning is complex, or the number of learners is small, it also makes it more difficult to take into account a wide range of prior knowledge and skills, and to ensure that the pace of learning suits everyone. Classroom learning can be effective when dealing with complex or intimidating content that requires significant discussion, confidence-building and feedback for those new to a discipline, or for developing a sense of community among learners.

Many NMHSs have their own training department, but a key issue is whether the trainers have the expertise (or can call upon it) and resources, and are available to deliver the required course. Those running in-house courses should ensure that the training is tailored to satisfy specific learning needs, uses material and equipment that are familiar to the learners, and takes account of the organizational context. However, there is the risk that some learners never get away completely from their normal job, so the learning process is not fully effective. Use of external courses is an alternative.

External courses delivered by outside organizations allow learners to get away from the pressure of their normal work, but can sometimes be generic rather than tailored. If the learning need is associated with transferable skills such as management, communication or customer relations, then a generic course might be an appropriate option.

5.3.2 ***Distance learning***

Distance learning is a formalized approach to learning in which the learners are far from the trainer. There are two modes of distance learning:

- *Synchronous*: all learners are involved in a learning activity at the same time, even though they are far from each other. This approach uses technologies such as webcasts, videoconferencing, teleconferencing and educational TV. In many cases, the trainer and learners can interact in a variety of ways, particularly with current web-based technologies;
- *Asynchronous*: learners access the learning material according to their own schedule and pace. A correspondence course is based on an asynchronous approach. Nowadays, a wide variety of communication technology such as DVDs and, most commonly, web-based material can be used.

Both distance-learning modes can be effective if the approach suits the learning outcomes and the activities are well designed.

While older forms of distance learning were limited in their options for interaction, recent forms provide substantial opportunities to ask questions, receive feedback and learn from other learners. Distance learning can be cost-effective especially if the learning resources are already available and relevant to the learning needs.

5.3.3 ***Blended learning***

Classroom courses and distance learning have been shown to be equally effective when well designed, but some learners prefer and thrive on the face-to-face interactions with trainers and fellow learners, while others prefer the flexibility of distance learning. Blended learning combines elements and advantages of distance learning and face-to-face courses.

In blended learning, elements of distance learning and classroom courses can be combined in any proportion or sequence. The distance-learning component could be trainer-led, self-paced or collaborative, synchronous or asynchronous, and could occur at any point in the course (at the beginning, end, or periodically). Similar to college courses, distance learning could involve assignments, readings or online activities that supplement more traditional classroom courses. However, in a blended course, the classroom sessions might be devoted to practical exercises, highly interactive discussions or simulations that require more trainer attention and feedback.

5.3.4 ***On-the-job training***

On-the-job training in the workplace uses the tools and facilities that are part of the job. Expertise is normally acquired through experience or instruction from a supervisor or more knowledgeable colleague. This type of training is particularly effective at developing skills and influencing behaviour. Usually, on-the-job training is aimed at specific learning outcomes that have to be satisfied before an individual is considered to be competent to work independently.

5.4 ***Semi-formal learning***

As with formal learning, there are a number of ways in which semi-formal learning can take place.

5.4.1 **Coaching**

Coaching is perhaps the most effective type of semi-formal learning. It is a systematic process where a more experienced person helps a learner develop expertise through a structured or semi-structured programme of guidance, feedback, demonstration or collaborative work experience, primarily to improve performance (often short-term) in a specific area of skill. While the learner has primary ownership of the learning goal, the coach has primary ownership of the coaching process.

A coach assists an individual in understanding performance and developing expertise. Coaching is particularly effective at enhancing existing skills and modifying behaviour. It can be directive – that is, telling someone what to do – or non-directive – that is, helping someone decide what to do. The latter approach involves active listening and questioning. If the existing skill level is good and improvement, rather than basic-level performance, is sought, non-directive coaching is more effective.

The main benefit of coaching is that it is tailored to meet the specific learning needs of an individual. It generates frequent and targeted feedback and allows individuals to take responsibility for their own development. But the coach needs good coaching skills and there has to be a positive relationship between coach and learner. The purpose of the coaching sessions needs to be clearly defined and planned. In many organizations, managers take responsibility for coaching their teams, but a more experienced colleague could perform that task as well.

5.4.2 **Mentoring**

Mentoring is a process by which a respected, trusted and competent individual provides guidance and advice to help less experienced people maximize their potential, develop their skills and improve their performance, often based on a long-term relationship. The learner owns both the learning goals and the learning process.

Mentoring is similar to coaching, but the mentor tends to be a highly experienced or senior person who has no line management responsibilities for the individual being mentored. A mentor provides more general and less frequent feedback than a coach, because the mentor is consulted at the instigation of the learner.

The mentor acts as a role model and a source of advice for work and career issues rather than providing the targeted, directive guidance of a coach. But as with coaching, success depends critically on a positive relationship between the two people and their desire for a successful process. The mentor might be a colleague, especially for someone taking up a post requiring new skills. Newly trained forecasters might, for example, benefit from having a mentor when they start at an operational station, particularly after they have already had sufficient on-the-job training and have attained a functional level of competence.

5.4.3 **Other types**

There are other forms of semi-formal learning that can be used, including the following:

- *Secondment*: moving to another part of an organization to develop the expertise and a broader understanding of the workplace to prepare for career progression;
- *Shadowing*: working alongside or with someone to develop skills or knowledge to carry out specific tasks;
- *Project work*: contributing to a project to broaden experience and develop project management skills.

5.5 Informal learning

Informal learning occurs in a variety of places, such as at home and work, and through daily interactions. It is often self-directed or unintentional and can take different forms:

- *Peer learning*: participating in a group that is supportive and shares experiences to give new perspectives and stimulate new ideas;
- *Self-study*: using self-selected learning resources to acquire skills and knowledge;
- *Practice*: developing expertise by doing the job;
- *Gaining access to corporate knowledge*: acquiring information from a knowledge management system to take advantage of the insights and experience of others;
- *Social networking*: using online applications that allow people to come together around an idea or topic of interest;
- *Social interaction*: acquiring knowledge unintentionally and perhaps without realizing it is happening, through casual or social interaction with colleagues.

5.6 Cost and resource factors

In choosing a learning solution, cost and resources are always critical factors.

Costs can be divided into two types:

- *Development costs*: those required for designing the learning event, preparing materials and developing evaluation plans;
- *Delivery costs*: those entailed in the use of facilities, trainers or facilitators, duplication of material, learners' time away from the job (opportunity costs), catering, accommodation, travel and administrative support.

For some solutions not all of these costs apply. Whether the learning activity is delivered once or repeatedly will make a big difference to the training costs per learner.

5.7 Developing an implementation plan

After determining the learning solution, which may include a variety of approaches to learning, an implementation plan should be prepared. The type of plan will depend on practices within the NMHS. However, the plan might include all or some of the following:

- *Plan context*:
 - Performance issue or changing requirements that need to be addressed
 - The benefits to the organization
 - The desired learning outcomes
- *Plan features*:
 - The planned learning opportunity, including timescale, costs and assessment of risks
 - How, when and where the learning opportunity will be provided

- Who will provide the learning opportunity
- The targeted learners and how they will be selected
- Evaluation criteria
- Roles and responsibilities of managers, trainers/facilitators and learners.

5.8 **Next step**

When determining learning solutions, it is important to consider the full range of solutions available and not simply make a choice based on tradition. The eventual choice of learning solution will depend critically on the learning needs – that is, what kind of knowledge, skill or behaviour needs to change – as well as the learning culture within the organization and the availability of resources.

Having chosen the solution, the next step is to design and develop the learning activities and resources.

5.9 **You and your organization**

In order to consolidate the material presented in this chapter, try answering the following questions:

- What constraints or considerations influence the choice of learning solution in your organization?
- Within your organization, how are learning solutions determined once a learning need has been identified?
- What are the main learning solutions used in your organization? Why do you use them? What are their strengths and limitations?
- Based on the current learning needs of your team, what would be the best learning solution and what are the reasons for that choice?
- To what extent is on-the-job training used to support other types of formal training?
- To what extent is semi-formal learning, particularly coaching and mentoring, used within your organization? What limits its use?