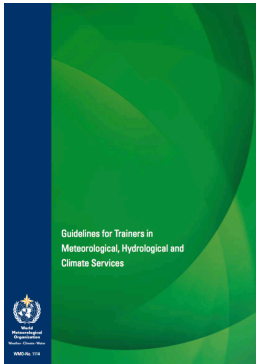# Chapter 4: Learning Needs

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)

http://www.wmo.int/pages/prog/dra/documents/wmo_1114_en.pdf

4.   LEARNING NEEDS

Competence II: Identify learning needs and specify learning outcomes

Competency description
A systematic approach is used to identify organizational and/or individual learning needs which are then specified in terms of a set of learning outcomes.

Performance criteria
- Apply a systematic approach to specifying job competencies and performing learning needs analysis;
- Base the identification of learning needs on job tasks or the existing competency framework;
- Identify organizational and/or individual performance gaps that are due to learning deficits;
- Specify learning needs that take account of organizational and individual requirements, the views of stakeholders and external factors;
- Set learning outcomes in collaboration with stakeholders so that, if the outcomes are achieved, learners will be able to perform the job at the required level.

Knowledge requirements
To be able to understand, explain and/or critically evaluate:
- Why learning needs occur and the benefits of learning needs analysis;
- Sources of performance gaps not related to knowledge, skills or behaviour (organization, motivation, management, tools and procedures);
- How to carry out competency definition and learning needs analysis;
- Sources of data and techniques used to identify learning needs;
- Ways of classifying learning outcomes.

Personnel who should demonstrate this competency
- Training managers;
- Trainers who would benefit from knowing how learning needs are identified within their organization;
- Line managers who carry out their own learning needs analysis before seeking the assistance of the learning professionals in addressing those needs.

4.1   Introduction

Learning needs analysis – also referred to as training needs analysis – is the systematic gathering of information about any gaps in the knowledge, skills and behaviour of staff, taking into account current and future organizational requirements and the capabilities of individuals. It consists of three steps as shown in Figure 4.1.
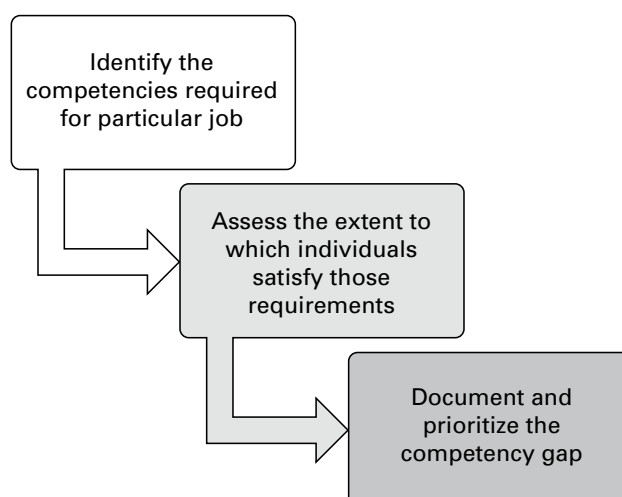

Figure 4.1. The three steps in learning needs analysis

Though this is the logical process to follow, it can be implemented in many different ways. It is important, however, that these three steps are covered in some way, whether they have already been taken within prior organizational efforts or need to be undertaken for new organizational initiatives.

Having carried out the learning needs analysis, the next step is to identify the learning outcomes that will address the competency gap.

The organizational context described in chapter 3 should be the basis for identifying learning needs.

4.2   Why analyse learning needs?

All NMHSs have restricted budgets for providing learning opportunities. Consequently, priorities should be based on a full understanding of the learning needs and the context in which they arise. This should be done on an ongoing basis to take account of the changing requirements and capabilities of the NMHS associated with factors such as:

–   Organizational objectives or strategy – for example, increased income, enhanced customer satisfaction or expansion/contraction of the workforce;

–   Products or services– for example, new services for the public or commercial customers;

–   Sources of information – for example, new remote-sensing data or output from an NWP model;

–   Work practices – for example, new forecaster workstations;

–   National or international standards – for example, new international standards for the provision of aeronautical services.

In addition to responding to changing requirements (doing new things), organizations need to maintain (doing things well) or develop (doing things better) the core expertise of staff. They must also be prepared to address the needs of new incoming staff at various levels of competency and education.

Identifying learning needs ensures that tasks are carried out by individuals with the right expertise. This can also lead to contented staff, because identifying and then addressing learning needs promotes job satisfaction and gives individuals the opportunity to develop their expertise and possibly progress in their careers. Meeting learning needs also encourages ambitious and talented individuals to remain within the organization. Furthermore, clearly specified learning needs provide trainers with a basis for choosing and designing learning solutions, and assessing whether the required learning has occurred.

4.3   What are learning needs?

The requirements for any job can be divided into three categories:

–   *Knowledge*: the information and understanding someone needs to perform the job;

–   *Skill*: what someone has to be able to do on the job;

–   *Behaviour*: how people should conduct themselves on the job.

There is a learning need if there is a gap between the knowledge, skill or behaviour of an individual and those required to carry out their job. A gap may occur because a job is evolving or because the person lacks the required expertise.

As indicated in Figure 4.2, there are learning needs associated with both organizations and individuals:

– *Organizational needs* are frequently associated with organizational strategy, restructuring of the NMHS, changing customer needs, technological/scientific developments and new national/international policies or standards;

– *Individual needs* are often associated with compliance requirements, performance issues, change of responsibilities and/or job requirements, and being new to the organization.

Between these levels are the learning needs of groups, teams or departments, which are sometimes referred to as occupational needs. These middle levels tend to reflect the organizational needs which may require varied responses from different parts of the NMHS. For example, introducing a new forecaster workstation or providing access to new remote-sensing data might create a learning need within the forecasting team and technology support group, but would have little impact on the rest of the NMHS. Alternatively, there could be a common learning need for people across different teams. For example, corporate strategy might indicate that management skills across the NMHS should be enhanced. Unique needs might arise not at the organizational level, but only for a particular group or department, such as a new administrative software package used only by managers and administrators.

Though it can be helpful to think of learning needs in terms of organizational, occupational and individual needs, there is often considerable overlap. Training departments are usually concerned with addressing both individual and occupational learning needs.

In this publication it will be assumed that organizational learning needs cover both the needs of the organization as a whole and those of specific occupations.

Sometimes the assessment of learning needs takes little account of individual requirements. For example, an initial forecasting course might have a standard content based on national or international standards and common assumptions about learners' knowledge of mathematics and physics.

Identification of learning needs is most effective if the process is shared among managers, job holders and trainers. Broad involvement creates a sense of ownership and awareness of the importance of addressing the learning needs.
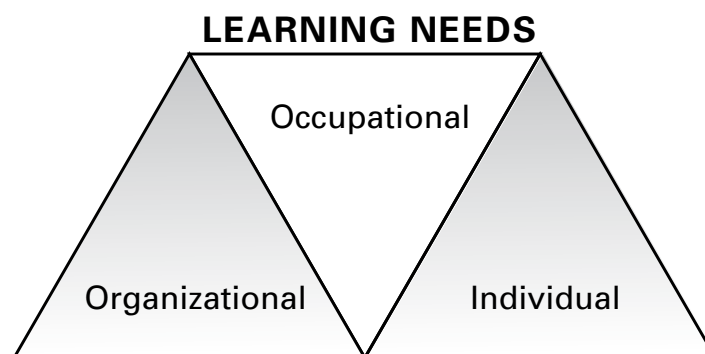

Figure 4.2. Types of learning needs within an organization

4.4   Sources of information about learning needs

Most NMHSs already have a lot of information that can be used to identify learning needs. In addition to the organization's strategic and operational plan and strategic learning plan, which were discussed in chapter 3, the following sources of information might be available:

–   *A risk register*: a document resulting from a risk analysis. It lists all project or organizational risks, their impact and likelihood, and methods of risk mitigation. A risk register might indicate any learning areas that have been identified as being critical for the organization;

–   *Succession plans*: having the right people with the right skills in the right jobs is essential for a successful NMHS. This is particularly important for key managers and specialists. For example, if a large number of senior managers or experienced forecasters are soon to retire, an organization needs to ensure their successors have the right level of expertise;

–   *Management information systems or quality management systems*: such systems provide information that allows managers to monitor activities and make decisions at the organizational or occupational level. This information might indicate a gap in performance. For example, the quality of warnings from one station may be much worse than that from another station. This could indicate a specific learning need for a group of forecasters, although consideration should also be given to other reasons, such as the effect of complex terrain or lack of observations;

–   *Performance management system*: most NMHSs have a performance management (appraisal) system to assess the performance of individuals against job expectations and to identify their development needs. This information can be useful for identifying learning needs, but its quality depends on the effectiveness of the performance management process.

Training will not always be the best approach to addressing a performance issue. Indeed, providing a learning opportunity might have no impact at all. Issues such as insufficient staff, inadequate systems or an individual's lack of native ability or motivation may be underlying factors affecting performance but cannot be addressed by providing learning opportunities. However, training is justified where lack of competence is the reason for poor performance (provided lack of native ability is not the root cause). A systematic approach to solving problems or providing opportunities related to the performance of people is called Human Performance Technology (see Box 4.1).

Box 4.1. Human Performance Technology

Human Performance Technology consists of the following three processes:
–   Performance analysis, which focuses on the work environment (resources, tools and policies), work (workflow, procedures and responsibilities) and workers (knowledge, skills and motivation);
–   Cause analysis, which considers several factors that might affect performance:
   -   Data, information and feedback
   -   Environmental support, resources and tools
   -   Consequences, incentives and rewards
   -   Skills and knowledge
   -   Individual capability
   -   Motivation and expectations
–   Intervention selection and design, which might involve training, but alternative solutions could include changing the work design, communication arrangements, the organizational structure or financial system.

Information about Human Performance Technology is available from the International Society for Performance Improvement at http://www.ispi.org/content.aspx?id=54.

4.5   **Process for analysing learning needs**

As indicated at the start of this chapter, analysing learning needs includes three basic steps:

1.   Identifying the competencies required for a particular job (now and/or in the future);

2.   Assessing the extent to which individuals currently satisfy those requirements;

3.   Documenting and prioritizing the competency gaps.

These will be considered more closely in turn.

Step 1. Identifying the competencies

A logical sequence to identify competencies is first to define the job responsibility and then to specify the tasks that must be performed to fulfil the responsibility. In most cases, it is necessary to identify several component activities that comprise a top-level task (for example, the top-level task of providing warnings might be split into two component tasks: forecasting hazardous weather and preparing and issuing warnings in accordance with agreed thresholds). Performance criteria might be included to describe characteristics of successful performance of the tasks. Finally, specify the knowledge, skills and behaviours required to carry out the tasks. Together, these components describe the competencies required for a job responsibility.

Competencies could have already been defined for some jobs so this step might not be required. Indeed, within the NMHS there might already be a competency framework covering many different jobs. However, for a new job or one that has radically changed, going through this process is beneficial.

Examples of WMO competency frameworks for a variety of job responsibilities can be found at http://www.wmo.int/pages/prog/dra/etrp.php in the online publications section.

Step 2. Assessing the current situation

The next step is to assess the extent to which individuals currently satisfy those requirements. As indicated in Figure 4.3 there are many techniques for doing this:

–   *Surveys*: use questionnaires to obtain information from many people. They should be relevant, valid and reliable, and data analysis tools and procedures should be in place;

–   *Interviews*: use a combination of prepared and follow-on questions to interview members of staff, including line managers and supervisors. A high level of listening and questioning skills is required;

–   *Self-assessment*: ask individuals to assess themselves against a set of competencies using a standard form;

–   *Direct observation*: assess the actions or behaviour of individuals against what is expected of them, either in the workplace or as a simulation;

–   *Assessment/development centre*: give small groups a set of tasks that allows them to demonstrate competencies whilst being observed by an assessor;

–   *Consulting key people*: seek the views of key people within the organization, such as senior managers, who have a broad view of the organizational context and the learning needs of a group;

–   *Focus groups*: assemble a group of people representing a particular job or function for which the learning needs are explored;
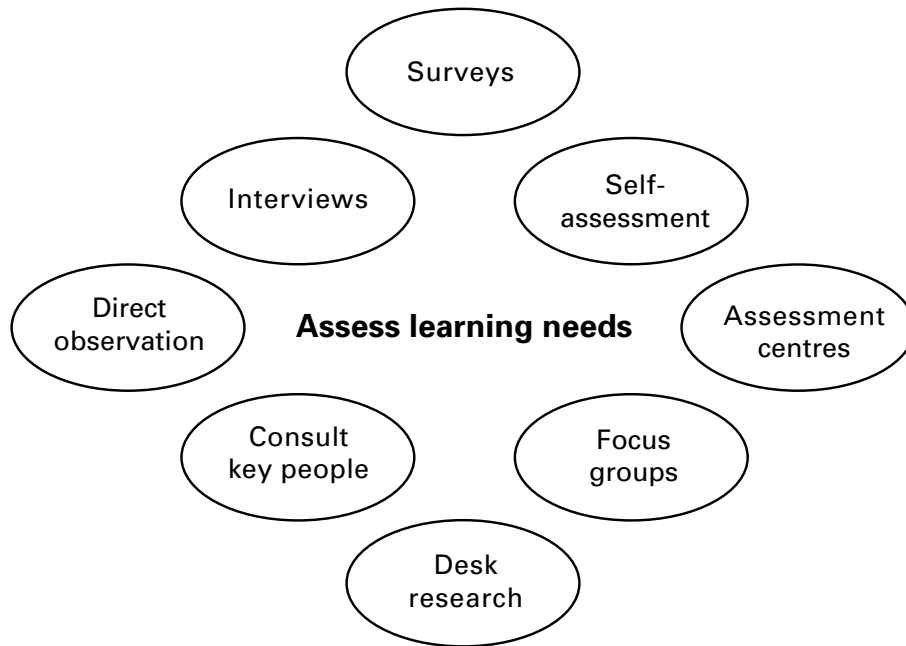
Figure 4.3. Different techniques for assessing learning needs

–   *Desk research*: review existing documents and reports such as logs of complaints or problems to assess whether there is an underlying learning need.

Although there are many techniques available for assessing learning needs, the approach taken will depend upon the culture of the organization, the management system used, the importance or prevalence of the job in the organization, the available resources, and the commitment of senior management. A combination of techniques might be used.

Step 3. Documenting and prioritizing competency gaps

The first two steps serve to identify the gap between the competencies required and those demonstrated. The results of the learning needs analysis have to be clearly documented and agreed with stakeholders. Part of that process could involve prioritizing the learning needs because it might not be practical to address them all. A key consideration for prioritization might be the risk to the organization of tackling or not tackling the learning needs.

4.6   **Learning outcomes to address the gap**

Once the analysis of learning needs has been completed and agreed, and priorities established, the next step is to define the learning outcomes (sometimes identified as learning objectives) that will address the gap.

Learning outcomes are statements of what a learner is expected to be able to do as proof of consolidation of knowledge, understanding or skills developed during a learning activity. These statements should be specific, measurable and achievable. Ideally, a learning outcome will include the situation (the circumstances in which the learner demonstrates what can be done), the action (what the learner can do) and the standard (a measure of success). Organizations often emphasize the actions (what the learner can do and/or whether the learner can apply the learnt knowledge to the tasks), rather than the situation and standard. This allows trainers to be flexible in helping learners at various skill levels and working in different contexts whilst still satisfying the learning outcomes.

Learning outcomes complete the statement: "After participating in the learning opportunity the learner will be able to....". The end of the sentence will vary according to whether the aim is to

change knowledge or skills. Different verbs will express actions associated with the specific outcome sought:

–   *Skills*: perform, make, select, use and operate (for example: "Use water vapour imagery to indicate areas of significant potential for convective weather");

–   *Knowledge*: identify, describe, define, explain and state (for example: "Identify the key atmospheric conditions required for fog formation").

For knowledge-based outcomes it is better to avoid verbs such as "appreciate", "know" or "understand" as these are more difficult to measure. Similar to competencies, learning outcomes are more usefully stated in terms of actions.

For learning interventions aimed at modifying behaviour it is more difficult to find suitable descriptions of learning outcomes. However, words such as "demonstrate an awareness (or appreciation) of", "comply with" and "display" could be used.

Much of what is learned is in the form of cognitive or thinking skills. For those outcomes, there is a commonly used hierarchy. Table 4.1 gives an overview of the various levels and some examples of the associated descriptors. The higher-order cognitive skills of analysing, evaluating and creating are built upon the lower-order skills of remembering, understanding, applying and analysing. As well as cognitive skills, there are also those associated with the psychomotor (physical coordination skills), affective (attitudes, values and beliefs) and interpersonal domains; these are described in Box 4.2.

Learning outcomes emphasize the results of learning rather than the learning process. In particular they:

–   Clarify what the learning event should achieve and thereby help to identify the best learning solution and method;

–   Ensure that learners and trainers understand what needs to be achieved, can prepare themselves and are able to gauge the progress they are making;

–   Ensure that the right people participate;

–   Provide a robust basis for assessing whether the required learning has taken place.

Table 4.1 Classification of intellectual behaviour and related descriptors

Cognitive skill level	Examples of descriptors
Remembering: the learner recalls information	list, define, identify
Understanding: the learner explains ideas or concepts	explain, interpret, discuss
Applying: the learner uses new knowledge in a familiar situation	apply, use, relate
Analysing: the learner differentiates between constituent parts and relates them to the whole	analyse, compare, investigate
Evaluating: the learner justifies a decision or course of action	evaluate, argue, recommend
Creating: the learner generates new products, ideas or ways of looking at things	create, organize, assess, predict

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2   This table is based on the classification of intellectual behaviour developed by Benjamin Bloom and colleagues (see Bloom B. et al., 1956: *Taxonomy of Educational Objectives, Handbook I: The Cognitive Domain*. London, Longman) later modified by L. Anderson and D. Krathwohl (see Anderson L. and D. Krathwohl, 2001: *A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives*. Longman).

Box 4.2. Psychomotor, affective and interpersonal domains

– *The psychomotor domain* deals with performing sequences of activities requiring manual dexterity, though this is often underpinned by cognitive understanding. The stages in this domain cover topics such as elementary and synchronised movements;
– *The affective domain* deals with attributes that are critical for learning. It includes a willingness to listen, to participate and to be involved;
The interpersonal domain deals with people interacting with others. It includes asking for and offering information, putting forward ideas, motivating others, and appropriately offering a different opinion.

The affective and interpersonal domains are not often addressed as part of a learning experience, unless the training is focused on related core competencies. To achieve affective and interpersonal outcomes, using face-to-face meetings, group discussions, coaching and motivational material can be of value. Unlike the cognitive and psychomotor domains, these domains are not often expressed as a hierarchy.

Skills in the psychomotor domain can be developed using practicals, demonstrations and simulations.

Learning outcomes provide the basis for designing and delivering any learning opportunities.

Writing good learning outcomes is not easy. The stakeholders who have called for the learning needs analysis need to agree on the learning needs. Ideally they would play a major role also in developing or approving the learning outcomes. Stakeholders should have a clear understanding of the measures of success that will be used. They should also indicate preferred types of learning solutions and the constraints that might apply.

4.7 Next step

The learning needs analysis and specification of learning outcomes will form an essential part of an implementation plan. But implementation also requires an appraisal of possible training solutions in terms of costs/benefits, non-financial aspects and resources. The extent to which those solutions satisfy all the required learning outcomes should also be assessed. The next step is concerned with determining learning solutions.

4.8 You and your organization

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

– What are the learning needs that your organization has to address in order to satisfy its aspirations?

– What information is available in your organization to assess learning needs and what techniques are used to identify them?

– To what extent is a systematic approach taken to identifying learning needs in your organization?

– Based on an analysis of the strengths, weaknesses, opportunities and threats (SWOT) of your training department (or equivalent), what are its own learning needs?

– What learning needs have to be satisfied so that you can further progress in your own career?