



LEARNING STRATEGIES GUIDE

for fire and emergency services organisations



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Australasian Fire and Emergency Service Authorities Council Limited
(ABN 52 060 049 327)
Level 1, 340 Albert Street
East Melbourne Victoria 3002
Telephone: 03 9419 2388
Facsimile: 03 9419 2389

afac@afac.com.au
www.afac.com.au

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PURPOSE OF THIS GUIDE

This *Learning Strategies Guide* is one of several guides produced to help with the development and delivery of learning materials for the fire and emergency services sector, and with implementation of the Public Safety Training Package.

LEARNING PROGRAMS

Fire and emergency service organisations use a range of learning programs. Those programs vary widely in their extent, complexity and in how they relate to specific job roles. Learning programs can include:

- Non-endorsed short courses designed for specific knowledge, skill or role requirements.
- Single units of nationally endorsed competency standards designed for specific knowledge, skill or role requirements.
- Multiple units of nationally endorsed competency standards designed for specific role requirements. These may be packaged together as nationally endorsed or organisation-designed skill sets.
- Multiple units of nationally endorsed competency standards leading to national qualifications. These may support one or more role requirements.
- Inclusion of organisation required content not described in national units may occur in programs when it is required for performance of the organisation's job roles.

The strategies that support effective learning apply to all learning programs irrespective of whether they carry national endorsement or not. There are specific requirements, however, when nationally endorsed competency standards is presented.

Design and development of training for the Training Package units and qualifications involves various stages. While these stages are represented sequentially in the diagram below (based on the ADDIE Model), they often overlap or need to be revisited should changes in requirements and needs occur.



THE ADDIE FRAMEWORK

There are different of approaches trainers can take when constructing learning programs. The ADDIE framework is well-known and is applied widely. It describes a sequence of five stages that trainers work through.

The ADDIE framework stages follow a linear path (as shown in the diagram below), in that it is recommended to have undertaken the preceding stage before commencing the one following. However, as is the case in many real-world situations, something that is uncovered in a later stage may require some revision of an earlier stage, with possible flow-on modifications throughout the process.



FIGURE 1: ADDIE FRAMEWORK

Source: based on the ADDIE Model – Larson Mirian B and Barbara B Lockee. 2014. *Streamlined ID: a practical guide to instructional design*. New York: Routledge.



CHAPTER 1: Analysis

When a need for training is identified and a decision made to develop training, it is necessary to determine what will be included in the training.

An analysis of who should be trained, and on what material, is the first stage in the ADDIE Framework and necessary to complete when developing a learning program.

Once the decision has been made that a need for training exists the question of what will be included in the training arises.

The first stage of the ADDIE framework is addressed here:

- **Analysis: What and who should be trained?**

1.1 CONDUCT THE ANALYSIS

The analysis stage, also known as training needs analysis, is essential as it will assist in answering the following:

- Is there a performance gap (e.g. between actual and desired performance)?
- Is there a gap in meeting other requirements (e.g. legal, agency or other)?
- What are the causes of the gap (e.g. knowledge, skill, behaviour, incomplete documentation)?
- What are the consequences of the gap (e.g. minor, moderate, serious)?
- What interventions will bridge the gap (e.g. administrative direction, supervision, training, assessment)?
- What are the priorities?

Put simply, training is a valid intervention when people do not have the knowledge and skills necessary to do a job in accordance with organisation and operating procedures and to the standard required.

At the end of the analysis stage, the components requiring training for the job to be done properly will be identified. It is also necessary to establish priorities and/or sequencing for the design and development of the training.

1.1.1. Job and task analysis

The job and tasks analysis involve asking and answering questions about the content and context of the training. It is best to do this at the start of the project to avoid having to make changes later. First formulate questions that address what needs to be known and then seek the answers to those questions.

It is helpful to group the questions under subject headings, for example, 'types of jobs' and 'tasks' and to identify factors for consideration within each group. As information is gathered, it is common to think of new questions or additional factors, include these in the analysis.

Table 1 provides example questions, placed into groups and lists factors for consideration when conducting the analysis. It is possible some or much of this analysis has been conducted previously, therefore, only requiring validation of the findings.

TABLE 1: QUESTIONS TO ASK IN A JOB AND TASK ANALYSIS

Source: adapted from Tovey & Lawlor 2008, pp. 181–182

Questions	Factors to consider
Types of jobs and tasks	
What are the job performance requirements and constraints?	- standards of performance required for this job - requirements to work individually and with others - dependence on the output from other people - dependence by other people on output from this job
What impact does the type of job and tasks have on the training?	- learners - training methods - delivery modes - venue - equipment - qualification of trainer(s) - costs - materials - assessment
Learners	
What are the special characteristics of the learners?	- levels of education - levels of literacy, numeracy, language - ages - experience levels - motivation - attitude
What do the above characteristics indicate for training methods and delivery modes?	- styles of learning - types of training methods suitable - types of delivery modes available - types of learning activities to be included - characteristics of venues available - assessment strategies
Skills	
What skills gaps exist?	- by individual - by level of employee - by section - by department - by organisation

Training setting	
What type of course is it?	• technical or general
What might be the best venue for this type of course?	• indoor or outdoor • training room or on-the-job • company premises or offsite
What special environmental factors need to be considered?	• shelter from sun or rain • air conditioning • exhaust fans and/or adequate ventilation • availability of required equipment
What dangers may be involved in the environment?	• chemicals • machinery • flame • heights • confined spaces • electrical
Analysis recommendations	
What recommendation does the analysis lead to?	• what needs to be added to the above information? • is there anything special to be taken account of? • is it possible/feasible to implement all the recommendations?

A variety of methods may need to be utilised to gather the required information, including:

- questionnaires
- individual and group interviews
- observation
- analysis of existing documents.

1.2. USE OF EXISTING TRAINING MATERIAL

At this point it is necessary to develop a clear picture of what previously developed design content will be used or included in the training, such as:

- **Nationally endorsed, previously used**
 - The job or task is described by nationally endorsed unit(s) that the organisation has previously used for training. This is the ideal situation.
 - Check for aspects of the job or task that do not correspond to how the unit(s) is written or how training was previously conducted.
- **Nationally endorsed, not previously used**
 - The job or task is described by nationally endorsed unit(s), however, the organisation has not previously used them for training.
 - Check for aspects of the job or task that do not correspond to how the unit(s) is written.
 - Check for any other training material that was used for the job or task.
 - Check with other organisations for training material for the unit(s) and compare that content with local practice.

- **Previous training, not nationally endorsed**
 - Training has previously been undertaken but there are no nationally endorsed unit(s) that describe it.
 - Check for aspects of the job or task that do not correspond to how training was previously conducted.
- **No previous training, not nationally endorsed**
 - No previous training has been undertaken for this job or task, and it is not described by nationally endorsed unit(s).
 - A comprehensive process of analysis is required. It is recommended specialists in this form of analysis are consulted to aid in gathering and interpreting job and task data.

Note: There are still some job activities undertaken within the fire and emergency services sector that are not addressed by nationally endorsed units. Describing how to have these skills written into nationally endorsed units is beyond the scope of this Guide.

1.2.1. Identify prerequisite units

Many of the units in the PUA PSTP identify prerequisite units. Where a unit of competency lists a prerequisite, the competence in this prerequisite unit must be achieved first. The pathway(s) by which learners may do this should be clearly identified. Where no pathway can be identified, achievement of the prerequisite units should be added to the project scope or established as a separate project.

It is a common practice to train to both a unit of competency and its prerequisite at the same time. However, issuance of the statement of attainment for the prerequisite unit must occur prior to issuing the statement of attainment for the unit for which it is a prerequisite.

1.3. USE OF SUBJECT MATTER EXPERTS (SMES)

SMEs can be used in many of the ADDIE phases, including the analysis phase. Efforts should be made to access SMEs who have recent and successful experience in performing the task or role being analysed. This is especially important for roles where there has been rapid change in the task environment

(e.g. new equipment, changes in built environment, changes in procedures or requirements). Detailed questioning and observation may be required to gather the information required for training design and development, as research has shown even the best SMEs are only 30 per cent aware of how they perform mental parts of even routine tasks (Clark (ND) s7).

Analysis should not rely on the information provided by a single SME. It is not unusual for SMEs to develop techniques and methods of performing tasks that may not be easily transferable to other people, especially novices. Several SMEs should be consulted to establish the range of techniques and methods in which novices may be instructed to perform a job or task.

1.4. CONSULTATION WITH INDUSTRY REPRESENTATIVES

To develop and deliver a training program that is current, relevant, valid and credible, it is vital Registered Training Organisations (RTOs) maintain contact and regularly consult with industry representatives. Most fire and emergency service organisations are RTOs (often referred to as Enterprise RTOs or ERTOS), as such the consultation required is between the RTO training section of the enterprise and its operational arm. Regular communication should be encouraged and maintained between the training and operations sections throughout all five stages of the ADDIE Framework or training cycle, as trainers can easily find themselves 'out-of-the-loop' when it comes to changes in workplace and operational requirements.

ERTOs need to maintain strong connections to other RTOs within their own sector and related industries to:

- keep up-to-date with the latest equipment, techniques and processes being used
- understand demands on other fire and emergency services organisations and the skills and knowledge required to meet those demands
- understand industry standards as applied in other jurisdictions.

It is valuable for trainers to establish and maintain information exchanges with other fire and land management organisations (whether ERTOS or not), to gain a broader appreciation of the industry, which can be incorporated into the individual ERTOS training programs.



CHAPTER 2:

Design a training program

After the analysis phase, the information needed to put together a training plan should be available. At this point decisions are required on how the course will delivered.

The second stage of the ADDIE Framework, **Design: What plan is best for training?**, addresses training program design and designing the best plan for a specific type of training.

2.1. DESIGN CONSIDERATIONS

Several considerations, such as learners' needs, available and required resources, and content requirements will inform the design of a training program.

2.1.1. Needs of learners

It is essential training meets the needs of learners, by being able to specify the desired training outcomes and understanding learners' current skill and knowledge levels, their past experiences, work and training. There needs to be an awareness of any requirements the learner may have, such as language, literacy and numeracy (LLN) needs or disabilities. If the learner is in a work role, their job requirements and responsibilities may need to be considered. This is expanded on later during the implementation phase (see 4.4. Establishing and meeting learner needs).

2.1.2. Resources

The resources required to deliver a training program include the materials and items that are the focus of the learning. When designing training, consider the resources available in the workplace, including relevant documents and materials. Examples include policies and procedures, common workplace forms, equipment and manuals. If there are specific procedures or permissions that must be met to obtain workplace resources, then these should also be referred to in the training.

In many instances, organisations adopt common practices which they embed in doctrine, improving interoperability within and beyond state and territory boundaries. Fire and land management organisations also adopt doctrinal material developed by other organisations.

AFAC and the Australian Institute for Disaster Resilience (AIDR) are the custodians of doctrine developed by their members and stakeholders. An example is the Australasian Inter-service Incident Management System (AIIMS), which has been developed by AFAC. AIDR produces the national disaster resilience handbook collection from which trainers may source information. AIDR also provides material relevant to specific topics such as prescribed burning through its Centre of Excellence for Prescribed Burning.

Other organisations providing important sources of doctrine and information include:

- Australian Resuscitation Council
- Bushfire and Natural Hazards Cooperative Research Centre (BNHCRC)
- Enterprise Registered Training Organisation Association Incorporated (ERTOIA)
- National Aerial Firefighting Centre (NAFC).

When designing training, it is important to consider the resources required when implementing training, including technologies and materials required for delivering presentations and facilitating activities. It is also important to consider the availability of trainers, SMEs and training resources, as these will affect when and how content can be delivered.

2.1.3. Common content areas

Sometimes a training needs analysis will show individuals need skills and knowledge that can be found in several units of competency, in which case the content can be addressed by grouping the topics together and integrating them into a common learning activity. The cost and benefits involved in developing training material for a group of units, as opposed to preparing separate training materials for each unit must be considered (see 3.2. Clustering).

2.1.4. On or off-the-job training

The training may be on-the-job, off-the-job or include a blend of both. No matter which approach is adopted, trainers need to work closely with industry to ensure activities and resources used in training are realistic and transferable to the work context.

The costs and benefits of on-the-job and off-the-job training should be considered. The physical environment is usually better for learning off-the-job. On the other hand, the link between learning and application can be enhanced by learning on-the-job.

2.1.5. Learning activities

Where possible, learning activities should reflect actual industry conditions and address the standards of performance required by the organisation. Where there are variations in processes, methods, equipment and resources (perhaps due to different geographic conditions), these need to be taken into consideration when identifying learning activities for an audience.

2.1.6. Available learning resources

When updating training material for transitioned units within the fire qualifications, RTOs will need to examine the learning design and resources used for the previous versions to determine if they can still be used. The unit mapping information in the *AIS Companion Volume Implementation Guide* for the Public Safety Training Package will be helpful to identify changes that have been made to units. For many of the transitioned units previous learning material will still be useful provided they have been kept up-to-date with current approaches and service delivery models.

2.2. ATTENDANCE AT TRAINING

The fire and land management sector has a diverse workforce. It can be, more or less, placed into one of three groups: career urban firefighter, volunteer firefighter (urban and rural) and land management firefighter.

At the Certificate II and III levels, there are separate qualifications for urban firefighters and those performing rural and land management firefighting and other response duties. From Certificate IV up, there is no distinction in qualifications between these groups. There are, however, many units common to all groups in each of the qualifications. The breadth of electives in each qualification provides organisations with the opportunity to specialise in their respective disciplines.

What also differs is how these groups attend training, particularly at Certificate II and III levels. These differences (described below) will significantly influence the design of training for each group.

2.2.1. Career urban firefighters

Across Australia and overseas, it is common practice for career urban firefighter recruits to attend an initial training period of approximately 16 weeks at a dedicated firefighter training facility. In Australia, this usually addresses the majority, if not all, requirements of the Certificate II in Public Safety (Firefighting and Emergency Operations) and many of the requirements of Certificate III in Public Safety (Firefighting and Emergency Operations).

With this approach, it is possible to spread the learning of any given unit or subject across the initial period of training to achieve the best learning results, to optimise exercises and simulations, and to achieve efficiencies across the course curriculum. Trainers are attached to the training facility and benefit from the opportunity to be entirely focussed on this role. There is a high degree of investment in career firefighting trainers which gives designers options for lessons, activities and assessments that may be beyond the competency level of part-time trainers.

Career urban firefighters are expected to return to their training facility at defined points in their career to learn more skills and for progression in the firefighting ranks. Attendance for blocks of two or more weeks to participate in this training is the norm. Once again, this provides a great deal of flexibility in training design options.

Career urban firefighters also participate in training programs whilst based at their stations. This on-station work may be linked to residential training programs or stand alone programs.

2.2.2. Volunteer firefighters

Most volunteer firefighters attend training at their local fire brigade or fire station after normal work hours and on weekends. There may be occasional attendance at weekday training courses, however, this is not the norm. In many instances, the completion of a single unit will require two or more weekends of attendance at training and attendance may not be on consecutive weekends.

The number of volunteers requiring training exceeds the numbers attending career urban firefighter recruit courses. Correspondingly high is the number of trainers required to deliver training to volunteers. Maintaining the competence and currency of trainers across an entire state or territory is a challenge for all fire and land management organisations and is particularly challenging within volunteer organisations responsible for wide geographical areas and large numbers of personnel to train.

Given the training is unlikely to be at a dedicated firefighter training facility, the available practical training options will require innovative approaches to delivery. The availability of trainers to present courses may be challenged by numerous factors including time, location and distance. Given the impact these factors can have on training design options, it is essential for the course design to be adaptable to a wide range of training environments.

2.2.3. Land management firefighters

Land management firefighters are generally paid employees of government or private organisations. Firefighting is one of the work requirements of their positions, often combined with prescribed burning. Attendance at training is during work hours as part of their duties. Courses, including induction training, are short term, seldom longer than one week in duration.

It is feasible to complete the learning requirements for several units required for a specific role or skill at one course, with the required practical application to achieve competency commonly undertaken on return to the workplace, with assessment.

The design options for land management firefighter training sit between and overlap those delivered to career urban firefighters and volunteer firefighters.

2.2.4. Online learning

The use of online training forms an increasing part of learning strategies for delivery of training. Online learning may form part of a learning program also including physical attendance at training or it may be delivered as a stand-alone program.

The inclusion of online learning should consider:

- the technological requirements for developers (e.g. equipment and knowledge or competence)
- the technological requirements for learners (e.g. equipment, data line speed requirements and knowledge or competence)
- alternatives for learners who may be disadvantaged by or unable to access online learning (e.g. location, disability).

2.3. SESSION SEQUENCE AND LEARNING OUTCOMES

Once it is clear what content is to be delivered and what design considerations must be built into the program, the design of the program itself can proceed. The following two factors are fundamental to effective training program design:

1. sequencing of the learning, as captured in the order of the training sessions
2. session learning outcomes.

Training program developers will need to have a clear understanding of how learning is expected to proceed so the content can be inserted at the appropriate stage.

2.3.1. Sequencing of required learning

The training program must achieve the overall objectives identified when the decision was made to conduct training. Commonly, several underpinning concepts and skills must be introduced before a learner can undertake tasks that integrate them together. The trainer needs to determine which topic is to be first, second or third, for example, a task demonstration at the start of a program may serve as a reference point for comprehending how the sequence of topics will lead to the outcome. Alternatively, a poorly sequenced training program may delay an information session that helps learners to understand why a task needs to be done in a given way.

Table 2 provides some approaches that could be used for sequencing required learning. It is worthwhile discussing the sequence with SMEs as well as with colleagues experienced in training program design.

TABLE 2: APPROACHES TO SEQUENCING REQUIRED LEARNING

From known to unknown	Once learners' knowledge and skill levels are established, begin training by covering content that learners are already familiar with and then introduce new material. Learners will be more receptive to new information if it is connected to familiar content. <i>For example, in groups, learners brainstorm what they know about fire behaviour. Once the group shares their answers, the trainer provides more detail through examples and explaining the components.</i>
From global to specific	This involves starting with the 'big picture' or larger issue and moving towards more specific pieces of information. Learners will gain a better understanding of the specifics if they understand context and background which comes with examining the issue at a macro level. <i>For example, learners are provided with information on general health and safety – once learners are comfortable with the terminology and content, the trainer can thoroughly explain aspects such as heat illness, personal protective equipment and clothing.</i>
Beginning from workplace examples	Learners are taught content by working with real or simulated examples from the workplace. Theory is taught alongside the application. This helps gain learners' interest and grounds theory in the practical. <i>For example, learners listen to a 2-way radio conversation. The protocols for using 2-way radios are then examined.</i>

2.3.2. Session learning outcomes

Each training program session should have a clear learning outcome(s) – what the learner can be expected to have learnt at the end of the session. The learning outcome allow learners and trainers to make judgements about whether the training program is progressing as planned.

Learning outcomes should not be confused with the elements or performance criteria in nationally endorsed units of competency. There must, however, be significant alignment between them or the training program would not be delivering on those units. Example 1 provides examples of session learning outcomes.

EXAMPLE 1: SESSION LEARNING OUTCOMES

At the end of this module, learners will be able to:

- Identify the three basic factors which affect fire behaviour and describe the general effects of each.
- Describe and demonstrate the types and methods of operation of vehicle protection and safety equipment.
- Describe heat induced illness including its prevention, symptoms and treatment.
- Describe the process of appreciation of an incident, and, for a given scenario, establish objectives for its control.
- Describe and demonstrate the process for developing an operational control structure at a range of incidents.

2.4. CONTEXTUALISING UNITS

Contextualisation of units of competency is about customising the content required for the units to suit specific organisational needs without diminishing their meaning or value. Units of competency define job tasks and the way those job tasks are completed can vary from one workplace to another. Units of competency may be contextualised to align with different:

- organisations or workplaces
- locations
- equipment
- procedures
- client types and profile.

RTOs may contextualise units of competency to reflect required local outcomes. Contextualisation could also involve additions or amendments to the unit of competency to suit delivery methods, learner profiles, specific enterprise equipment requirements or to otherwise meet local needs (see Example 2). The integrity of the intended outcome of the unit of competency, however, must be maintained.

When contextualising units of competency in this endorsed training RTOs:

- must not remove or add to the number and content of elements and performance criteria

- must maintain the integrity of the industry skill and portability requirements, including all legislative licensing and any other regulatory requirements
- may add specific industry terminology to performance criteria where this does not distort or narrow the competency outcomes
- may make amendments and additions to the range statement if such changes do not diminish the breadth of application of the competency and reduce its portability
- may add detail to the evidence guide in areas such as the critical aspects of evidence or resources and infrastructure required where these expand the breadth of the competency but do not limit its use

The information contained in the *Companion Volume Implementation Guide* can assist developers, trainers and assessors to understand the context of a unit and help to ensure contextualisation does not inadvertently breach any of the conditions described above.

If units of competency were not contextualised, all learners across the country would get the same training, irrespective of their local work requirements. Units need to be contextualised so performance standards, terminology, facilities, equipment and operating procedures specific to jurisdictional, organisational or learner needs are clearly articulated in the training program.

EXAMPLE 2: CONTEXTUALISATION

Examples of contextualisation could include:

- substituting organisationally approved terms for generic terms contained in the performance criteria, for example, the names of workplace policies
- adding to the range of conditions, for example, to specify a type or brand of equipment
- making reasonable adjustments to suit learner needs.

2.4.1. The contextualisation process

The following three step process is recommended for contextualising units:

1. determine the units of competency to be contextualised
2. identify an SME to work with
3. review and contextualise the entire unit, including the assessment requirements, in collaboration with an SME.

Also consider for each task in the unit:

- Who are the people who support or inform the task (if any)?
- When and for how long the task occurs?
- Where does the task happen?
- What materials, equipment or information are required to complete the task?

If the contextualisation process is resulting in many changes or changes that could be considered as changing the context or application of the unit, the developer should consult with their supervisor or the RTO manager before proceeding further. Example 3 provides an example of contextualisation of a cross-sector unit, appearing in several Public Safety qualifications. The right column includes notes and questions for the trainer to commence to contextualisation process.

EXAMPLE 3: SAMPLE CONTEXTUALISATION

Source: PUAOPE014A Navigate to an incident

Element	Performance criteria	Contextualisation notes
2. Determine and plan a safe route	2.1 Navigation plans are prepared according to organisational practices.	What type of navigation plans are routinely developed in this organisation? Who contributes to their development?
	2.2 Maps, navigation techniques, map features, local and environmental conditions are interpreted to determine and plan a safe and timely route.	
	2.3 Potential access restrictions which may limit thoroughfare are identified and arrangements are made to gain access in accordance with organisational policies, practices and regulatory requirements.	What access restrictions are pertinent to this group of learners? For instance: • road and bridge load limits • one-way roads • road width, steepness, surface • legal and other permissions.

2.5. CONTENT AND LEARNING ACTIVITIES

The content of each session must satisfy the requirements of the learning outcomes for that session. The design document should provide specific direction or parameters for the developers to work within when they develop each session.

The activities taking place in each session must support achievement of the learning outcomes. Possible activities include:

- discussions
- drills
- individual or group exercises
- instructor led presentation
- presentation of case studies (by presenter or learner)
- reading assignments
- role plays
- simulations
- videos.

The design specifies activities as being required for certain areas of content. If not, the program developers will select and include those activities they think most suitable. Another possibility is to develop a range of activities from which the trainer may select the more appropriate for their learner cohort (see Chapter 3 for more detail on activities).

Viewed together, the session activities must deliver the session content. It is recommended each session deliver content using more than one activity (e.g. presentation and simulation).



CHAPTER 3:

Develop a training program

Stage three of the ADDIE framework is addressed here.

Development: Create and assemble the content components

As a result of work conducted throughout the analysis and design stages, the training program consists of a series of sessions specifying learning outcomes, content requirements and learning activities. It is also likely some form of assessment activity may have been specified or prepared.

The third stage of the ADDIE Framework, development, is where the detailed content of the training material is written. There are numerous texts, websites, principles and opinions that provide (often conflicting) advice on how to develop training content, and on how learners learn. The following is a selection of ideas and approaches that may be useful.

3.1. PHILOSOPHY OF INSTRUCTIONAL SUPPORT IN TRAINING

Philosophy of instructional support in training is a contentious field with many competing theories, each with its own supporters. This Guide cannot provide a detailed examination of the learning theory; however, it does draw on two important, yet contrasting, ideas from the theoretical discussions trainers should be aware of:

1. **Discovery model:** Learning is a natural activity for humans. Humans learn language, how to think and how to perform a myriad of physical tasks with minimal instruction. People learn by being presented with problems and discovering the way to solve them.
2. **Guidance model:** Learning is an activity requiring direct instruction and purposeful practice. It is important task fundamentals are mastered before attempting to deal with complex problems.

It is possible to think of examples that support each of these ideas. It has been suggested that for humans some types of learning are innate, for instance learning a first language. On the other hand, learning a second language later in life appears to be much more difficult, and does require instruction. Clark, Kirchner and Sweller (2012) suggest that fully guided instruction is preferable

3.1.1. Guidance versus discovery in learning

The following findings adapted from Clarke (2009, p. 161) describe the results of research into the two ideas about learning: discovery and guidance.

When guidance is preferable to discovery during learning

Instructional guidance is defined as providing learners with accurate and complete procedural information and related underpinning knowledge they have not yet learned through demonstration. The demonstration shows how to perform the necessary sequence of actions and make the necessary decisions to accomplish a learning task and/or solve a problem. Instructional guidance also encourages learners to practice by applying the demonstrated procedure to solve problems or accomplish tasks. Such problems or tasks are representative of the performance expected in an environment suited to application and receive supportive and corrective feedback during their practice.

This guidance model or approach to guidance is based on three defining criteria:

1. Guidance must provide an accurate and complete demonstration of how (decisions and actions) and when (conditions) to perform a task or solve a class of problems.
2. When adaptive transfer is required, guidance must also provide the varied practice and declarative knowledge that permits learners to adapt a procedure to handle a novel situation. (Adaptive transfer is the conscious or intuitive process of applying or reshaping learned knowledge in new and potentially unfamiliar situations. Declarative knowledge refers to facts or information stored in the memory, that is considered static in nature.)
3. Guidance requires individual application of procedures accompanied by immediate corrective feedback on part and whole-task versions of problems and tasks that represent those to be encountered in the transfer environment.

Clarke discusses each of these points in some detail, providing examples. Most training undertaken in this sector requires adaptation of knowledge and training-based experience to novel situations. Prior to implementation of the complete training program, however, it may be necessary to confirm the three criteria are adequately addressed.

Most trainers will have encountered instances of where some people in a group quickly grasp how to do something and others do not. The situation may then be reversed when a different type of task is to be learned. Differences in what people learn easily and quickly affect how a course should be developed. In virtually all training in this sector the intent is for all people attending a training program to achieve all the learning outcomes.

There should, therefore be an expectation that in any given session, some learners will reach the learning outcome before the lesson is completed. On the other hand, some will require the full session and some without additional support, may not achieve the outcomes before the session ends. The course content should be developed with each group in mind, especially those requiring additional instruction to achieve learning outcomes.

3.1.2. First principles of instruction

Adopting the guidance model of learning leads the developer to constructing a series of discrete and deliberate steps to the building of the course content. David Merrill's series of principles in Table 3 assist developers to construct effective learning programs (2009, Chapter 3, pp. 41–56). These principles are consistent with Clarke's three criteria and taken together provide guidance to developers when constructing effective lessons.

TABLE 3: PRINCIPLES FOR EFFECTIVE LEARNING PROGRAMS

Source: David Merrill 2009

Principle	Description
Demonstration	Instruction should provide a demonstration of the skill consistent with the type of component skill: kinds-of, how-to and what-happens Instruction should provide guidance relating the demonstration to generalities Instruction should engage learners in peer-discussion and peer-demonstration Instruction should allow learners to observe the demonstration through media that are appropriate to the content
Application	Instruction should have the learner apply learning consistent with the type of component skill: kinds-of, how-to, and what-happens Instruction should provide intrinsic or corrective feedback Instruction should provide coaching, which should be gradually withdrawn to enhance application Instruction should engage learners in peer-collaboration
Task-Centred	Instruction should use a task-centred instructional strategy Instruction should use a progression of increasingly complex whole tasks
Activation	Instruction should activate relevant cognitive structures in learners by having them recall, describe, or demonstrate relevant prior knowledge or experience Instruction should have learners share previous experience with each other Instruction should have learners recall or acquire a structure for organising new knowledge
Integration	Instruction should integrate new knowledge into learners' cognitive structures by having them reflect on, discuss, or defend new knowledge or skills Instruction should engage learners in peer-critique Instruction should have learners create, invent, or explore personal ways to use their new knowledge or skill Instruction should have learners publicly demonstrate their new knowledge or skill

3.1.3. Explicit and direct instruction

The terms explicit instruction and direct instruction are often referred to in discussions of education and learning. Training developers should understand what the terms represent. Allan Luke's work (2014, p.1) provides useful definitions for both, however, note in many cases, references to direct instruction describe explicit instruction.

What is explicit instruction?

In the field of education, explicit instruction refers to teacher-centred instruction that is focused on clear behavioural and cognitive goals and outcomes. These in turn are made 'explicit' or transparent to learners through 'strong classification' and 'strong framing', resulting in clearly defined and bounded knowledge and skills, and teacher-directed interaction.

What is direct instruction?

The term direct instruction refers to a specific version of explicit instruction, based on the classical behaviourist stimulus/response/conditioning models. Teachers follow a step-by-step, lesson-by-lesson approach to instruction that follows a pre-determined skill acquisition sequence.

Archer and Hughes (2011, Chapter 1) refer to explicit instruction as a system of instructional scaffolds:

‘first through the logical selection and sequencing of content, and then by breaking down that content into manageable instructional units based on learners’ cognitive capabilities (e.g. working memory capacity, attention, and prior knowledge). Instructional delivery is characterised by clear descriptions and demonstrations

of a skill, followed by supported practice and timely feedback. Initial practice is carried out with high levels of teacher involvement, however, once learner success is evident, the teacher’s support is systematically withdrawn, and the learners move toward independent performance.’

Archer and Hughes (2011) also provide descriptions of the foundations of explicit instruction, as detailed in Table 4, many of which could be beneficially applied to firefighter training. These elements will inform the development of the lessons as well as guide the implementation of each lesson. Developers should be familiar and comfortable with these elements, so they can select tools that will appropriately deliver learning outcomes suited to the subject matter and the learners’ needs.

TABLE 4: SIXTEEN ELEMENTS OF EXPLICIT INSTRUCTION

Source: Archer and Hughes, 2011 (pp. 2–3)

	ELEMENT	DESCRIPTION
1	Focus instruction on critical content	Teach skills, strategies, vocabulary terms, concepts, and rules that will empower learners in the future and match the learners’ instructional needs.
2	Sequence skills logically	Consider several curricular variables, such as teaching easier skills before harder skills, teaching high-frequency skills before skills that are less frequent in usage, ensuring mastery of prerequisites to a skill before teaching the skill itself, and separating skills and strategies that are similar and thus may be confusing to learners.
3	Break down complex skills and strategies into smaller instructional units	Teach in small steps. Segmenting complex skills into smaller instructional units of new material addresses concerns about cognitive overloading, processing demands, and the capacity of learners’ working memory. Once mastered, units are synthesised (i.e. practised as a whole).
4	Design organised and focused lessons	Make sure lessons are organised and focused to make optimal use of instructional time. Organised lessons are on topic, well sequenced, and contain no irrelevant digressions.
5	Begin lessons with a clear statement of the lesson’s goals and your expectations	Tell learners clearly what is to be learned and why it is important. Learners achieve better if they understand the instructional goals and outcomes expected, as well as how the information or skills presented will help them.
6	Review prior skills and knowledge before beginning instruction	Provide a review of relevant information. Verify that learners have the prerequisite skills and knowledge to learn the skill being taught in the lesson. This element also provides an opportunity to link the new skill with other related skills.

7	Provide step-by-step demonstrations	Model the skill and clarify the decision making processes needed to complete a task or procedure by thinking aloud as you perform the skill. Clearly demonstrate the target skill or strategy to show the learners a model of proficient performance.
8	Use clear and concise language	Use consistent, unambiguous wording and terminology. The complexity of your speech (e.g. vocabulary, sentence structure) should depend on learners' receptive vocabulary, to reduce possible confusion.
9	Provide an adequate range of examples and non-examples	In order to establish the boundaries of when and when not to apply a skill, strategy, concept, or rule, provide a wide range of examples and non-examples. A wide range of examples illustrating situations when the skill will be used or applied is necessary so that learners do not underuse it. Conversely, presenting a wide range of non-examples reduces the possibility that learners will use the skill inappropriately.
10	Provide guided and supported practice	In order to promote initial success and build confidence, regulate the difficulty of practice opportunities during the lesson, and provide learners with guidance in skill performance. When learners demonstrate success, you can gradually increase task difficulty as you decrease the level of guidance.
11	Require frequent responses	Plan for a high level of learner-teacher interaction via the use of questioning. Having the learners respond frequently (i.e. oral responses, written responses, or action responses) helps them focus on the lesson content, provides opportunities for learner elaboration, assists you in checking understanding, and keeps learners active and attentive.
12	Monitor learner performance closely	Carefully watch and listen to learners' responses, so that you can verify learner mastery as well as make timely adjustments in instruction if learners are making errors. Close monitoring also allows you to provide feedback to learners about how well they are doing.
13	Provide immediate affirmative and corrective feedback	Follow up on learners' responses as quickly as you can. Immediate feedback to learners about the accuracy of their responses helps ensure high rates of success and reduces the likelihood of practising errors.
14	Deliver the lesson at a brisk pace	Deliver instruction at an appropriate pace to optimise instructional time, the amount of content that can be presented, and on-task behaviour. Use a rate of presentation that is brisk but includes a reasonable amount of time for learners' thinking/ processing, especially when they are learning new material. The desired pace is neither so slow that learners get bored nor so quick that they cannot keep up.
15	Help learners organise knowledge	Because many learners have difficulty seeing how some skills and concepts fit together, it is important to use teaching techniques that make these connections more apparent or explicit. Well organised and connected information makes it easier for learners to retrieve information and facilitate its integration with new material.
16	Provide distributed and cumulative practice	Distributed (vs massed) practise refers to multiple opportunities to practise a skill over time. Cumulative practise is a method for providing distributed practise by including practise opportunities that address both previously and newly acquired skills. Provide learners with multiple practise attempts, in order to address issues of retention as well as automaticity.

Archer and Hughes (2011) sixteen elements may also be distilled into smaller sets of teaching functions for easier comprehension, as illustrated in Table 5, however, the expanded elements in Table 4 contain important detail.

TABLE 5: SIX TEACHING FUNCTIONS

Source: Archer and Hughes, 2011 (p. 4)

FUNCTION		DESCRIPTION
1	Review	- Review relevant previous learning - Review prerequisite skills and knowledge
2	Presentation	- State lesson goals - Present new material in small steps - Model procedures - Provide examples and non-examples - Use clear language - Avoid digressions
3	Guided practice	- Require high frequency of responses - Ensure high rates of success - Provide timely feedback, clues, and prompts - Have learners continue practice until they are fluent
4	Corrections and feedback	Reteach when necessary
5	Independent practice	- Monitor initial practice attempts - Have learners continue practice until skills are automatic
6	Weekly and monthly reviews	

These functions are based on a traditional classroom: homework, weekly and monthly reviews. The urban career firefighter attendance model could apply them as written in block training, however, some adaptation may be required in the other modes.

Traditionally, firefighter training has been developed in a manner largely consistent with explicit instruction. For those programs that would benefit from retaining this type of instruction, it may be beneficial to consider if and how each element could be applied in course design, development and implementation.

3.2. CLUSTERING

Clustering is a process that can be used when developing learning and assessment materials. to develop processes and materials to meet the requirements for groups or clusters of units of competency rather than individual units. Clustering units of competency allows similar or complementary content items to be delivered at the same time, thus, reducing duplication in content covered and the amount of training to be provided.

Presenting skills and information to learners depends on the context of the learning environment, whether it is on-the-job, off-the-job or blended delivery. Whichever mode, it will sometimes be appropriate to cluster delivery and create single activities that cover aspects of two or more units, where common skills and/or knowledge exist, for example, units may have similar knowledge requirements, as illustrated in Example 4.

EXAMPLE 4: OVERLAPPING KNOWLEDGE REQUIREMENTS OF TWO UNITS THAT COULD BE CLUSTERED

PUAFIR213 Assist with prescribed burning	PUAFIR204B Respond to wildfire
• burn ignition and suppression tactics and techniques • extinguishing media and equipment • fire behaviour • fire hazards • ignition media and equipment • organisational operating and work health and safety procedures • working safely around fire	• communication on the fireground • extinguishing media, water, foam, suppressants • fire behaviour (fuel, weather and topography) • health and fitness requirements • hygiene and wellbeing • organisational operating procedures • safe work practices • wildfire control tactics and techniques • wildfire hazards, safety techniques

It would, therefore be beneficial to cluster when a requirement appears across units rather than repeating the training. It is important to note, when clustering, the requirements of each unit must be met, including this knowledge requirement in the context of the specific tasks reflected in individual units.

3.3. CHUNKING

The concept of chunking learning material is based on the theory that short-term memory can only hold five to nine chunks of information (seven plus or minus two), where a chunk is any meaningful unit (Miller, 1956). A chunk could refer to digits, words, chess positions or people's faces. The concept of chunking and the limited capacity of short-term memory has become a basic element of all subsequent theories of memory.

To chunk information is to break down the main information or knowledge block into smaller parts where each part is addressed separately. This makes information easier to follow and understand. Ideally, no more than five chunks of information should be presented to learners at any given time. Retention of information also increases if learners are familiar with the concepts covered and terms used, and the information is logically sequenced and simple.

When presenting information visually, consider doing so in basic geometric positions (triangles, squares, pentagrams, hexagons) and the sorts of positions found on dice and dominos. This takes advantage of a learner's ability to discern the number without counting and is one way of anchoring information that can facilitate the acquisition and recall of chunked information.

3.4. DEVELOPING CONTENT AND LEARNING ACTIVITIES

The Public Safety Training Package units of competency and associated assessment requirements set out what skills and knowledge must be assessed, and these have been addressed separately in the preceding sections. Outside of the learning environment, however, a graduate instead needs to be able to integrate this knowledge and skill. The knowledge evidence within the assessment requirements specifies what the individual must know to safely and effectively perform the work task described in the unit of competency. By continually linking the theory or knowledge being taught with the skill or workplace performance expected, the learner will be able to better integrate the two and work more effectively. The course sessions must provide the opportunities for learners to develop both knowledge and skill.

3.4.1. Training methods

The roles of the trainer and learner in the learner's learning is the subject of significant discussion. The following extract from a training methodology course by Makokha and Ongwae (ND), provides a useful, however, not definitive outline of how training methods may be grouped according to the roles each play.

Instructor/trainer centred methods

Here the trainer casts themselves in the role of being a master of the subject matter. The trainer is looked upon by the learners as an expert or an authority.

Learners on the other hand are presumed to be passive and copious recipients of knowledge from the trainer. Examples of such methods are expository or lecture methods – which require little or no involvement of learners in the training process. It is also for this lack of involvement of the learners in what they are taught, that such methods are called 'closed-ended'.

Learner-centred methods

In learner-centred methods, the trainer is both a trainer and a learner at the same time. In the words of Lawrence Stenhouse, the trainer plays a dual role as a learner as well 'so that this classroom extends rather than constricts his intellectual horizons'. The trainer also learns new things everyday which they didn't know in the process of training. The trainer, 'becomes a resource rather than an authority'. Examples of learner-centred methods are discussion method, discovery or inquiry-based approach and the Hill's model of learning through discussion (LTD).

Content-focused methods

In this category of methods, both the trainer and the learners must fit into the content that is taught. Generally, this means the information and skills to be taught are regarded as sacrosanct or very important. A lot of emphasis is laid on the clarity and careful analyses of content. Neither the trainer or the learners can alter or become critical of anything to do with the content. An example of this would be training learners in the performance of a specific drill.

Interactive/participative methods

This fourth category borrows a bit from the three other methods without necessarily laying emphasis unduly on either the learner, content or trainer. These methods are driven by the situational analysis of what is the most appropriate thing for us to learn/do now given the situation of learners and the trainer. They require a participatory understanding of varied domains and factors.

3.4.2. Activities to develop skills

Well-planned delivery utilises a variety of activities to engage learners and facilitate their learning, and allow learners to:

- understand the level of performance expected of them, according to industry performance standards and qualification requirements. It is essential expected levels of performance are made clear
- understand how the training will improve their own work practices and how this relates to their ability to meet industry requirements
- observe a demonstration of the skills or competencies required
- practise the skills or competencies required and receive feedback to improve performance
- review and understand the criteria for evaluation or assessment, prior to undergoing assessment or evaluation.

The observation and practise of skills can be carried out in different ways and often includes a variety of settings:

- formal training such as classrooms or simulated environments, where learners can use equipment and carry out tasks as they would in a workplace
- on-the-job, where learners can work beside qualified people to observe and where appropriate, take on real tasks, duties or projects with support available.

3.4.3. Activities to develop knowledge

A delivery plan will also incorporate learning activities to develop knowledge, and will need to ensure learners are provided with the opportunity to develop knowledge of current approaches, philosophies and service delivery models. Examples of activities to develop knowledge are included at Example 5.

EXAMPLE 5: ACTIVITIES TO DEVELOP KNOWLEDGE

BEYOND INFORMATION

A learning strategy that only delivers and examines information in a theoretical way has limited value. Competency is about applying knowledge and being able to draw links between knowledge to work effectively. Activities should focus on this, for example:

- knowing about reporting requirements (e.g. fire status) is of limited value, a learner also needs to know how the requirements are applied in the organisation, the implications of failure to report, the scope of their role in this area and critically, to demonstrate their ability to make a report
- knowing about fire behaviour in a theoretical situation is intended to lead towards recognising and understanding the factors influencing fires that learners will observe, which in turn will influence decisions they make in relation to that fire
- being able to describe the functions of the Australasian Inter-service Incident Management System (AIIMS) leads to knowing how those functions interrelate and ultimately, in how to work within or manage those functions effectively.

Using current and credible industry sources

For fire and emergency service organisations, much of the knowledge required for competent performance is held within the organisation. Some organisations may have specialisations another organisation may need to know about to ensure safe and effective operations (e.g. aviation or fire investigation). Professional associations, government departments (e.g. Bureau of Meteorology, Civil Aviation Safety Authority) and industry bodies (e.g. AFAC, AIDR, International Search and Rescue Advisory Group, Standards Australia, ISO, the Australian Resuscitation Council) are all key sources of credible and current information to inform the knowledge base. Resources produced by these organisations can be used as the basis for developing knowledge and familiarising learners with concepts that can be applied to different workplace scenarios. A list of various sources for different sectors can be found in the *AIS Companion Volume Implementation Guide*.

Organisation policies and procedures

Obtain and use samples from real organisations wherever possible. Consider the implications of not following organisational procedures to the worker, client and the organisation.

Accreditation standards

Obtain and use accreditation standards documents to ensure assessment conditions meet the standards for equipment and resources.

Developing knowledge before practical application

There is no hard and fast rule, however, there is some knowledge that must be taught before a learner is able to apply skills, especially if this involves interaction with other people in a clinic or work placement.

3.4.4. Types of activities

There is an ever-expanding list of possible activities that may be used in training. A subset of these are often used by fire and land management organisations. The following is intended to provide the training developer some information on where and when each might be effective.

INSTRUCTOR-LED PRESENTATION (LECTURE)

A lecture is an oral presentation of information by the instructor to relay information including principles, concepts, ideas and theoretical knowledge about a given topic. In a lecture, the instructor tells, explains, describes or relates whatever information the trainees are required to learn through listening and understanding. It is, therefore teacher-centred, the instructor is very active, doing all the talking. Learners on the other hand are very inactive, doing all the listening. Despite the popularity of lectures, the lack of active involvement of learners limits the usefulness of lectures as a method of instruction.

The lecture method is recommended for learners with very little knowledge or limited background knowledge on the topic. It is also useful for presenting an organised body of new information to the learner. To be effective in promoting learning, the lecture must involve some discussions and a question and answer period to allow active involvement from learners.

Advantages:

- Conveys large sum of information.
- Fast.
- Forum allows exploration of content in detail.
- Address many people at once in a relatively small space.

Disadvantages:

- Communication is largely one way and audience is largely passive.
- Trainers may have difficulty in gauging level of learning achieved.

Comments

- Trainer should be an interesting speaker, able to self-limit and stick to time, be able to facilitate questions effectively.
- Lecture should not exceed the trainees' attention span (up to 25 minutes).
- Lectures are best suited to skilled trainers who can hold learners' attention.

USE OF OVERHEAD SLIDES

Overhead slides provide an opportunity for the trainer to reinforce what is said with words and pictures visible to all learners.

Advantages:

- Concepts that are difficult to convey verbally can be illustrated.
- Learners focus can be maintained on subject matter by words on the slides.
- Slide content can help trainers keep to topic and lesson plan.

Disadvantages:

- Learners can only focus on one thing at a time: either the trainer or the slide.
- Wordy or complex slides distract learners from what the trainer is saying.
- Slides can 'drive' lesson if trainer is not skilled at presentation.

Comments

- Slide content should be minimal and support the trainer's lesson.
- Trainers should not read content from the slide. If learners cannot read the slide from the back of the room, do not show it.
- Trainers should 'black out' slides from time-to-time to keep focus on topic rather than the slides.
- Reduce unnecessary animations etc. to ensure minimal distraction from the learning points.

DISCUSSIONS

Discussions involve two-way communication between learners around an issue or topic, which is directed towards a specific learning objective. During discussion, the trainer spends time listening, while the learners discuss the issue or topic. The discussion is, therefore, a more active learning experience for the learners than a lecture.

A class can be divided into groups, each of which conducts its own discussion and the trainer spends time with each group. There may also be an opportunity for all groups to finalise the discussion as a class, with the trainer facilitating the process.

Advantages:

- Provides a useful follow up to a lecture.
- Keeps trainees involved and interested.
- Provides opportunities for different views and experiences to be shared.
- Learner participation tends to result in better retention of lessons.

Disadvantages:

- Learning points can be lost if discussions go off topic, particularly if groups are used.
- A few people may dominate the discussion (plenary or group).
- Time can slip and if the trainer cuts off the discussion, learners can feel their views were not valued.

Comments

- Trainers need to ensure instructions are clear and the discussion is kept on topic.
- Time management is critical.

DEMONSTRATIONS

The trainer demonstrates an example of the subject matter. The trainer needs to:

- set a scenario
- explain procedures that will be performed, including why it is done that way
- outline and observe all safety requirements
- carry out the demonstration
- include explanations of key steps and points to note
- evaluate and report on the performance demonstrated.

The demonstration should be limited in scope. Learners need to know before the demonstration begins what they should focus on.

Advantages:

- Aids comprehension and retention and stimulates learners' interest.
- Can give learners a model to follow and the standard of performance required.
- Provides a rich picture of what the learning is leading to.

Disadvantages:

- Trainer demonstrations may be difficult for all learners to see well.
- Learners can lose interest in demonstrations that take more than a few minutes, as their involvement is minimal

Comments

- Materials, tools and equipment need to be at hand and in working order.
- The demonstration must closely follow the practice to be learnt and not show an expert's shortcuts.
- A failed demonstration has serious consequences for trainer credibility and may teach bad habits.
- Do not use a learner's material to demonstrate on.
- A demonstration that runs for more than 15 minutes is likely to lose learners' interest.

GROUP EXERCISES

The class is divided into groups and groups are given a task or exercise to complete, usually within the confines of the classroom. The exercise assigned must be pertinent to the lesson content preceding and/or following. Unlike group discussions, group exercises have required outputs the group are expected to produce. The trainer must monitor each group's progress through the exercise to ensure the learning outcome is being achieved. Each group can be given a different exercise. This provides for a wider range of content to be covered when the exercise outcomes are discussed.

At the end of the exercise the process and/or product should be discussed; the trainer should show how each group's work illustrates some aspect of the lesson. If all groups are doing the same exercise, discussion should move from group to group rather than examine one group's work in its entirety before moving on to the next.

If groups have been allocated different tasks, either the trainer or a group member needs to frame the exercise for the other groups before it is discussed, ensure the time allocated to each is similar, and the time is kept short to ensure learners can absorb as much information as possible.

Trainers should consider the appointment of a leader for each group, together with leadership expectations. This can mitigate some of the disadvantages of this type of activity.

Advantages:

- Exercises provide learners with an opportunity to apply what has been learnt to a situation in a controlled and safe environment.
- Large and complex work requirements can be broken into smaller pieces, each the subject of an exercise.

- Exercises should be relevant to what learners will be required to perform work in their workplaces.
- The group environment provides opportunities for learners who have understood a lesson to reinforce that lesson; learners who may not have comprehended a lecture may find their understanding improves through application.

Disadvantages:

- Not all group members may contribute equally to the exercise.
- Being an outcome focussed exercise may lead to those with the best skills and knowledge dominating.
- Those whose understanding is weakest at the start may be given the least opportunity to improve.
- Assigning different exercises to each group requires significant work to ensure the learning outcome for each group is equivalent.

Comments

- Group size is critical; three to five people per group is recommended.
- Discussion time is often underestimated.
- Allow double the exercise time for the discussion.
- Trainers must have ideal answers prepared for each exercise.
- Learners who have made an investment in completing the exercise will very likely want to know how well they performed.
- The trainer will need to account for what is reasonable variation between learners' outcomes and the ideal.

INDIVIDUAL EXERCISES

This is similar in nature to group exercises, however, the task is to be performed by each learner alone. Individual exercises should only be run when there is a reasonable likelihood of each learner being able to successfully achieve the outcome. Individual exercises are useful in the lead up to assessment. Both trainers and learners have opportunities post-exercise to rectify any performance gaps before assessment occurs.

In most instances, the exercise undertaken will be the same for all learners. Once the answer or outcome is made known, a discussion about what enabled or restricted the learners' performances should be had. This must focus on what was done or not done, not on who did it.

Advantages:

- Learners and trainers both get a good understanding of what learning has taken place.
- A single exercise can be used by everyone in a class.

Disadvantages:

- Learners who are not ready will likely fail at the exercise, which may inhibit their willingness to continue with the learning.
- Poorly led discussions that focus on being right or wrong can similarly affect learner enthusiasm.

Comments

- Exercises need to be straightforward to evaluate, ideally the learner can do that once the trainer has identified the satisfactory outcomes.
- The trainer should have strategies prepared to deal with lower than expected or desired performance, especially if assessment follows soon after the exercise.

DRILLS

Drills are formalised practises of established procedures required by people performing work roles. They are used when performance of tasks needs to be done in a consistent manner. The reasons may include safety, efficiency or the task is part of a larger undertaking that must follow a predictable pathway. Drills are often performed in teams, where team members perform different component tasks. Team members may be required to perform one or more of those tasks to gain proficiency in the procedure.

Drills are often comprised of smaller component skills learnt early in the development of firefighting competence. Drills are commonly introduced in the training learners undergo and practising those drills can continue throughout the time the person continues to work in that role.

The advantage of having several commonly performed procedures practised repeatedly and predictably in performance is less likely to be adversely affected under the stressful conditions firefighters are subjected to. In time critical, high consequence environments, this protects both firefighters and the people firefighters protect.

Advantages:

- Learners learn to practise skills to the level of competence required at the workplace in the same format as is applied in the workplace.

Disadvantages:

- Drills and their component tasks can appear to be without purpose to novice learners, risking disengagement from the learning.
- The reasons for why a drill is done a certain way needs to be taught alongside the drill.

Comments

- Drills can have many interconnected component parts and the development of competence in drills can require many repetitions.
- Trainers should select the component skills within the drill learners should focus on as they gain experience.

CASE STUDIES

Case studies present a set of problems to be worked through by learners. Many are based on real-life scenarios or cases. They are designed to incorporate problems and issues associated with the subject matter that may only be encountered occasionally. Learners are encouraged to identify and examine factors that could affect performance and decision making, to envisage how situations could develop and to come up with strategies to deal with each scenario.

When real-life case studies are used the theoretical results are placed alongside what did happen and learners discuss why and how each alternative scenario path might have played out. In some case studies, the people who worked at the incidents explain what happened, their understanding at the time and their reflections on the event.

Advantages:

- Case studies are valuable tools for advanced study of a skill area.
- They are a means to integrate many learning outcomes into a unified body of knowledge necessary for a learner to perform a complex role.

Disadvantages:

- Case studies take a lot of work to be effective learning activities.
- Too little content renders them superficial and is no better than a simpler to construct exercise.
- Too much content or poorly framed problems makes it difficult to distinguish good performance from bad.

Comments

- On occasion learners are told stories by experienced practitioners to illustrate aspects of workplace performance.
- These should not be regarded as case studies unless the learners are expected to examine the information and develop responses to questions.

READING ASSIGNMENTS

A selection of readings which provide important background or specific information is given to learners, together with a task to be performed. Detailed and complex information requires time to be read, digested and understood. Different people will take varying times to do this, making reading tasks unsuitable for the classroom. Learners are often encouraged to discuss the readings with each other outside the classroom. Learners are encouraged to develop alternative arguments in response to the tasks trainers set with the readings.

Advantages:

- Complex information and concepts can be approached at the learner's pace.
- Reading assignments are well suited to higher level learning programs.

Disadvantages:

- Many people find the cognitive challenges readings often pose difficult to manage.
- They are unsuited to people with low levels of literacy.

Comments

- Ensure copies are easy to read or learners will not bother.
- Learners need to be provided with the motivation or sufficient reason for them to take the time and effort to digest the information.
- Readings must always have a reason to be read; they should not be provided if they are not for some purpose.

ROLE PLAYS

Learners act out problem solving situations like those they will encounter in their workplace. Trainers need skill and understanding; they must get people into roles, give directions, and establish a climate of trust. Trainers need insight into how an activity may pose a threat to some individuals and can help learners understand what they observe in the role play.

The most important part of the role play is the discussion (debrief) that takes place afterwards. The debrief should focus on the significance of what was said and done, rather than who said or did it.

Advantages:

- When done well, role plays increase a learner's self-confidence, giving them the opportunity to understand or even feel empathy for their own and other people's viewpoints or roles and can end with practical answers, solutions or guidelines.
- Role plays can help learners to consolidate different lessons in one setting and are good energisers.

Disadvantages:

- Role plays can be time consuming and their success depends on the willingness of learners to take active part.
- Some learners may feel a role play is too exposing, threatening or embarrassing. This reluctance may be overcome through careful explanation of the objectives and the outcome.
- Some role plays can generate strong emotions amongst the learners. It is, therefore essential a role play is followed by a thorough debriefing providing the opportunity for the trainer and the learners to raise and assess new issues.

Comments

- Trainers must have specific learning outcomes the role play is intended to meet, without these, the activity becomes a game or a form of entertainment.
- To be effective role plays need to have people suspend their disbelief and sense of vulnerability when placed in difficult situations. The trainer must establish an environment where there is respect for each role player and the process.

- The scenario needs to be relevant to the subject matter. Props relevant to the scenario should be provided and language (jargon) used appropriate to the subject matter at hand.
- When setting up the scenario, establish the rules and boundaries the role play must stay within. Be sensitive to issues pertaining to culture, gender and disadvantaged groups and avoid discriminatory language
- Some learners may get too far into the roles. Some may refuse to take part. Others may be unable to fully embrace the challenge of role playing and may break the illusion by playing the role for laughs.

SIMULATIONS

A model is a representation of a system, entity or process. Simulation represents the operation of a model over time. Simulations differ from most other activities in that what happens next to the learners depends on what they just did (in accordance with the model). Simulation is useful because learners experience the relationships of cause and effect. It is especially useful when these relationships are complex and require intervention.

Because simulation deals with complexity and variability, using simulation effectively for training and exercising requires focused scenario design and high-quality facilitators. As with all other training activities, the learning outcomes need to be clearly identified before the simulation is created. Simulation can support the acquisition, practising and validation of skills and if well designed, the one simulation can be reused for each of these purposes.

Simulations can provide a way to deal with scenarios not easily replicated or may carry too high a safety risk to perform in the workplace.

Simulations can be single or multi-player. They may use information and communications technologies (ICT) or be constructed without them. The closer simulation scenarios resemble real world situations the better, however, good learning can take place in low fidelity simulations.

Advantages:

- Simulations provide a degree of complexity and responsiveness to learner participation that is greater than any other learning activity.
- Multi-player simulations add in the factor of human interactions, making them especially valuable.
- Well constructed simulations are especially valuable in scenarios where safety and expense preclude running real-world exercises.

Disadvantages:

- Simulations are expensive to build and can be expensive to maintain and run.
- They require the participation of skilled developers, trainers, SMEs and often ICT experts.

Comments

- AFAC has developed a program to train simulation facilitators: *Facilitating Simulation-Based Training for Incident Management Teams*. It is recommended trainers familiarise themselves with this program before embarking on development of a simulation.

VIDEOS

The showing of videos as part of a presentation is a common training activity. It is a very useful way to communicate information and to demonstrate work practices.

The role of the trainer is to connect the video content with the learning outcomes of the session and to support learners in how they incorporate video content into their understanding of the subject matter.

Advantages:

- The demonstrations shown are of a known standard and can be replayed as required, to reinforce learning.
- The same information can be presented to an unlimited number of learners.

Disadvantages:

- Videos are slow and expensive to make.
- It can be difficult to update them to maintain currency as procedures and practices change.
- Videos can quickly become dated and learners switch off.

Comments

The length of the video is important. Findings from a recent study by Fishman (2016), highlight key considerations when making or using videos, including:

- videos up to two minutes long have strong and steady engagement
- attention to videos drops steadily between two and six minutes
- attention stays steady between six and 12 minutes
- after 12 minutes attention continues to drop steadily.

Trainers can still use longer videos effectively if they pause the video and introduce other types of activity. This is beneficial for another reason: learners may not retain a point made early in the video if it runs for more than a few minutes. Pausing the video, once or more, for questions or discussion places the trainer back in control of the session.

If there are aspects of the video that are no longer current, edit these out or inform learners of the anomalies before they view the video.



CHAPTER 4: Implement a training program

Stage four of the ADDIE framework is addressed here:

Implementation: How should we deliver training?

Having worked through the fourth stage of the ADDIE Framework and developed a training program, the trainer's guide, facilitator's guide or lesson plan should now include detailed guidance for the training for the course. The penultimate stage of the ADDIE Framework, implementation, looks to guide the implementation of the training program and identify key considerations for trainers.

It is likely and necessary for there to be capacity for the trainer to make choices within any guide or plan. This is required to ensure reasonable adjustment is possible to meet the learning needs of all learners. Similarly, the training style and personalities of each trainer are different. One trainer cannot imitate how another does the job. Each trainer must develop their own way of delivering training, one that is effective for learners and feels comfortable for the trainer.

4.1. ESTABLISHING A RELATIONSHIP WITH LEARNERS

The relationship between trainer and learners is subject to different views. Some argue to keep learners at arm's length and others say trainers should be close to the learners. Trainers are therefore, in a special position of trust.

In fire and emergency service organisations, it is common for trainers to know many of the learners before they attend courses. This means there will already be some form of established relationship. In some instances, the learner may even have a more senior position or rank than the trainer. It is important the trainer establishes, through words and behaviour, respect for the roles of trainer and learners in the

course. This needs to accompany the establishment of a non-threatening, open and honest, helpful learning environment for the learner to work in.

Tovey and Lawlor (2008, pp. 226–228) provide the following advice and considerations applicable to trainers in fire and land management organisations:

1. ***Wear clothes that are suitable for the type of training and learners.*** This will often mean wearing the organisation's uniform or personal protective clothing. If a course specifies the non-wearing of uniform, ensure a dress code is provided and the trainer should dress at the upper end of that code.
2. ***Use appropriate language.*** Do not use jargon that your learners will not understand, although you should use jargon which they are used to in their job. Ensure that you use language at a level which is suitable for the learners you are training. Do not use words they will not understand. Sometimes you will need to use language that is simple and at other times more complex. Be careful with humour; ensure that you do not breach legislation on sexual harassment, equal employment opportunity and anti-discrimination.
3. ***Your personal behaviour can be an important influence on learners.*** If your body language says, 'I don't want to be here', then it may demotivate learners. If you are too fidgety, too quick, too slow, too animated, or too enthusiastic, you may distract learners from their task. Always be supportive and focus on your learners. A learner focus will assist you to understand their needs and enable you to 'read' them and take appropriate action.
4. ***You should move around a bit.*** Don't stay in the one spot glued to the floor or a lectern. Learners will become bored and inattentive if you stay still. Move around a little to keep their attention on you. Ensure that your movement is appropriate though – there is nothing worse than trainers who constantly pace from one side of the room to the other.

5. **Make your voice interesting.** Use variation in tone and pitch of your voice, sometimes fast, sometimes slow, sometimes with excitement and sometimes quite serious. Use silence to reinforce a point and allow learners to ponder the point. Above all, encourage two-way communication and be enthusiastic about the training and the learners: after all the training is for them.
6. **Be creative.** Much of the training we do is the same as that which has been done somewhere else at some other time. Learners may have had multiple exposures to a course or session. The way you differentiate your presentation is by being creative in the session design, activities and aids that you use. However, this does not mean free-for-all. Delivery must meet the course and session learning outcomes.
7. **Get your own feedback.** Ask a colleague to sit in on your sessions occasionally to provide you with some feedback on how you are going. If you don't have a colleague use a video camera. You could even get learners to assess you.

The central message from the points above is that the trainer's technique must centre on the learner, not the trainer. Skilled trainers have developed techniques to assist learners in achieving learning outcomes and transferring those back to the job.

Trainers should take the opportunity to observe other trainers perform and talk to the trainers about the techniques they use and how they developed them. Trainers need to be learners of training and to apply the principles of learning to themselves.

4.2. RESOURCES

There are several resources trainers may need when they present a training session, including:

- documents
- equipment
- personnel
- venue.

The session plan should list what is required. Trainers may want to amend this to suit how they will conduct the session.

4.2.1. Documents

Trainers may need several different types of documents to run a session, including:

- guides and plans
- manuals
- exercises
- forms and procedures
- training administration.

Trainer's guide and session plans

The trainer's guide should provide session plans for each session. The preceding section gives some advice on how trainers might adapt the session plans to make them work for the trainer and the learners in the training environment they find themselves in.

Session plans can take different forms, with greater or less detail. Irrespective of the format, trainers should ensure they can refer to the plan easily while they conduct the session. If trainers plan to adapt or vary the plan, they should have amended the plan accordingly.

It is a good idea for trainers to make notes in the session plan immediately after the session when unplanned adjustments were made or if the plan did not work as intended. This information should be provided to the developers so they can improve the document.

Learning manuals

If learners have a manual they refer to in the session, the trainer should also have a copy to show or refer to. The session plan should refer to the learning manual where learners are expected to refer to it during the lesson.

Exercise documents

The documents required for exercises must be present and organised so that the trainer can easily locate and hand them out to learners. They must be straightforward for learners to use and understand so they do not become an impediment to the learner's learning.

Workplace documents

Any workplace forms, procedures or other documents used should be up-to-date and presented in the same format learners will encounter them in the workplace.

Training administration documents

Forms required for compliance with organisational or RTO needs must be held and applied at the appropriate point in the session.

4.2.2. Equipment

A range of different types of equipment may be required to run a session. Trainers will need to check if workplace equipment is accessible always or if it is used in the organisation's daily operations. Also check whether equipment needs to be altered to meet the additional needs of learners.

Training aids

- computers
- projectors
- pointers
- whiteboards
- pinboards
- stationery

Workplace equipment

- tools
- vehicles and appliances
- consumables such as fuel, oxygen, foam
- information and communications technology, such as radios, GPS

Administrative equipment

Trainers may need access to printers, photocopiers or other equipment before or during a session.

4.2.3. Personnel

The trainer may require the presence of subject matter experts during a session. Some activities may require additional supervisors so learners can perform the activities safely and in accordance with organisational procedures.

For extended training sessions it may be desirable to have additional trainers present to share the presentation load.

If assessment is part of a session, there may also be specific personnel required for the assessment to take place.

4.2.4. Venue

The venue the trainer will be using to conduct the training may enable or limit presentation options. The trainer should establish, ahead of the training course, how the venue will influence the conduct of the training. Rearrangement may be required to make the venue more suitable to run the course.

4.3. WORKING WITH LEARNERS AT DIFFERENT STAGES OF DEVELOPMENT

Ideally, the processes applied to those selected to attend a course would exclude those who are unlikely to successfully complete the course. Inevitably, however, some learners will gain entry to a course and not achieve the learning outcomes as anticipated.

At any point in time in a course there will be some learners who are more advanced than others in their learning, in relation to either the course or session learning outcomes. This is a significant issue if the degree of progress is not likely to lead to successful completion. It will affect each aspect of the course, especially how trainers manage the activities learners participate in. Trainers, therefore need to consider how they respond to this range of progress.

Most training programs include activities where the learners are divided into groups. Those groups may be assigned the same task or groups can be assigned different tasks. If the degree of progress in learning is evident then the trainer has the option of dividing the class into two or more cohorts, based on the stage of learner development. This stratification has been referred to as streaming and there are advantages and disadvantages of streaming and not streaming.

Advantages and disadvantages of streaming

- The trainer can work with all learners at a similar stage of development, at the one time, in a group. This is an efficient use of the trainer's time. There may not be enough time available to work with the less advanced learners individually in each group.

- Learners at more advanced stages of development may be allowed to undertake self-directed learning activities, thereby releasing more time for the trainer to devote to others.
- The learners themselves are likely to be willing to participate in the group activity with others at a similar level because they are less likely to feel inadequate or embarrassed.
- Placing learners in groups at different stages of development may have a negative effect on the self-esteem of those in lower level groups and may discourage them from continuing to participate in the learning.

Advantages and disadvantages of not streaming

- In mixed skill-level groups, the more advanced learners can assist the less advanced learners. This has benefits to the more advanced, as teaching someone is a recognised method to reinforce learning. The total time of assistance provided by advanced learners in each group can exceed what the trainer can offer as it occurs within each group concurrently.
- In mixed skill level groups, however, the least skilled may be unwilling to risk appearing inadequate or find themselves unable to contribute meaningfully to group work. More advanced learners may leap ahead to get the group work done and the less advanced gain very little from the experience.
- The trainer can acknowledge to the learners that people have come into the course with different levels of skill and experience. Expectations can then be placed on all learners, particularly in group work, that each group member is expected to:
 - contribute to the best of their ability
 - provide opportunity for and respect each other's contributions
 - assist others to the best of their ability.

In most instances, streaming is not adopted and strategies to specifically assist the less skilled learners may not be applied until formal or informal assessment processes reveal a problem. At this stage, there may be little time available for remedial action, and any such action will appear to the learners as a form of streaming regardless of the label placed on it.

4.4. ESTABLISHING AND MEETING LEARNER NEEDS

Trainers may encounter learners that have needs that require adjustments to how training may normally be conducted.

According to the *Standards for Registered Training Organisations (RTOs) 2015*, all RTOs must have a strategy in place outlining how it will establish learners' needs. Establishing the needs of learners can be achieved in different ways – through an informal or formal interview, by completing a questionnaire or pre-training assessment or combinations of those approaches. Interviews allow for learners to be asked directly about their learning preferences and any additional needs they may have. Other times, the needs of the learner may be self-evident, for example a learner with a mobility aid will need access to lifts and ramps to access rooms and other facilities. RTOs should cater for learners with additional needs wherever possible to allow these learners to participate in training.

Understandably, there will be learners who are embarrassed or self-conscious of their additional needs or current skill levels. Some learners will be adept at masking their additional needs, especially in relation to low levels of language, literacy and numeracy skills; this can be a challenge for trainers and will require thorough observation of learners' progress.

In cohorts of learners where language, literacy and numeracy skills may be at low levels, or learners with other specific needs may be present, it is good practise for trainers to make it known to all learners at the commencement of training that there are options available for how activities will be run, and assessments conducted. They should also make it clear that irrespective of how assessment is conducted, everyone will still be assessed to the same standard.



CHAPTER 5:

Evaluate a training program

Stage five of the ADDIE framework is addressed here.

Evaluation: How will we measure success?

In the final stage of the ADDIE Framework, evaluation, all training programs should be reviewed and evaluated for effectiveness and future improvement. Best practice indicates training evaluations should be conducted, not only at the completion of a training program but periodically throughout the program. As reflective practitioners, trainers should be constantly monitoring their own and learners' progress and identifying areas requiring further improvement. Evaluations can provide evidence on:

- advantageous and effective use of program inputs (cost, personnel, time, materials and facilities)
- whether training has been effective and met the outcomes
- satisfaction levels of stakeholders, including learners with the desired outcomes.

5.1. THE FOUR-LEVEL APPROACH

In 1959, Donald Kirkpatrick developed a four-level evaluation model to determine the effectiveness of training sessions. He identified four levels requiring evaluation: reaction, learning, behaviour and results.

Tamkin, Yarnell and Kerrin (2002) examined the Kirkpatrick model alongside a number of models developed since. Their conclusions determined the four-level approach was still relevant and useful, however, factors other than the training itself will affect behaviour and results.

5.1.1. Application of four-level evaluation

Table 6 provides a brief guide to how evaluation may be undertaken, further discussion for each is included in sections 5.2 to 5.5. It is recommended trainers and training managers conduct further research before commencing evaluations to ensure the results are valid and meaningful.

TABLE 6: KIRKPATRICK 4-LEVEL EVALUATION MODEL: EXAMPLES OF TOOLS, RELEVANCE AND PRACTICABILITY

Kirkpatrick level	Examples of evaluation tools and methods	Relevance and practicability
1. REACTION	• 'Happy sheets', feedback forms • Verbal reaction, post-training surveys or questionnaires	• Quick and easy to obtain • Inexpensive to gather or analyse
2. LEARNING	• Typically, assessments or tests before and after the training • Interview or observation can also be used	• Relatively simple to set up; clear-cut for quantifiable skills • Less easy for complex learning; not always suitable
3. BEHAVIOUR	• Observation and interview over time are required to assess change, relevance of change and sustainability of change	• Measurement of behaviour change typically requires cooperation and skill of line managers
4. RESULTS	• Measures are already in place via normal management systems and reporting – the challenge is to relate to the trainee	• Individually not difficult; unlike whole organisation • Process must attribute clear accountabilities

5.1.2. Level 1: Reaction

Reaction refers to the degree to which learners react favourable to the learning event.

At the first level, trainers measure how learners reacted to the training program. It is a measure of learner satisfaction and is commonly evaluated by a 'tick and flick' sheet asking learners to respond to questions, including:

- Did learners enjoy the training program?
- Was content covered relevant to their respective job roles?
- Was training material easy to understand?
- Was the trainer engaging?

While it is understood a positive experience for the learner does not guarantee learning, a negative experience almost certainly reduces the likelihood of learning.

5.1.3. Level 2: Learning

Learning refers to the degree to which learners acquire the intended knowledge, skills and attitudes based on their participation in the learning event. This level attempts to shed light on whether learners' skills and knowledge have improved, usually determined by testing or assessing learners in some way, for example, written or oral questioning or asking a learner to demonstrate a skill.

5.1.4. Level 3: Behaviour

Behaviour refers to the degree to which learners apply what they learned during training when they return to the workplace.

Training strategies and programs set out to change behaviour. In other words, rather than learning how to operate equipment more effectively (skills), employers want to see the individual operate the equipment safely and effectively to produce accurate results for clients. Rather than just remembering hygiene policies, employers want to see individuals applying the policies to their work. Some of this behaviour change depends on the learning program; some depends on the workplace itself. For behaviour to change, Kirkpatrick (1959) states the person must:

- want to change
- know what to do and how to do it
- work in the right environment
- be rewarded for changing.

The first two requirements can be met in a training program; the remaining two are dependent on the workplace conditions.

5.1.5. Level 4: Results

Results refers to the degree to which targeted outcomes occur, as a result of the learning event(s) and subsequent reinforcement.

The final level attempts to measure training effectiveness in terms of successful outcomes for learners as well as meeting skill needs of industry. In other words, measurements at this level are expressed in terms of increased productivity, increased quality of work, cost savings and reduced time off work from decreased frequency of work-related accidents and injuries.

These are really the measures for a return on investment in training, which are often more difficult to evaluate.



CHAPTER 6:

Feedback and references

6.1. FEEDBACK

If you have any ideas, resources, case studies or feedback to contribute, please provide your feedback to AFAC contacts.

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