

**Defence Training Support Manual 5**

**Evaluation of Individual Training**

**2023 Edition**

**Version: 1.0**

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# How to use this Manual

1. Defence Training Support Manuals (DTSM) have been developed to support the understanding and implementation of the policy contained in JSP 822.
2. JSP 822 is the authoritative policy that directs and guides Defence people to ensure that Defence Learning (training and education) is appropriate, efficient, effective and, most importantly, safe.
3. DTSMs will be published every December, following the publication of the latest version of JSP 822. Throughout the year, different versions of the latest DTSM edition may also be published. When every new edition is published, the versions will reset to 1.
4. Using the DTSMs is entirely optional, and users may find there are alternative resources available to help them understand and implement the policy contained in JSP 822.
5. Throughout this document there are references to other DTSMs, these references contains hyperlinks that will take you to the DTSMs that are held on the [TSLD Defence](https://modgovuk.sharepoint.com/sites/people-tesrr-policy/SitePages/TESRR.aspx) [Training Policy and Requirements](https://modgovuk.sharepoint.com/sites/people-tesrr-policy/SitePages/TESRR.aspx) SharePoint site.
6. The DTSMs currently available are:

|  |  |  |
| --- | --- | --- |
| **DTSM**  **Number** | **DTSM**  **Name** | **SharePoint Link** |
| DTSM 1 | Governance of Individual Training | Link |
| DTSM 2 | Analysis of Individual Training | Link |
| DTSM 3 | Designing Individual Training | Link |
| DTSM 4 | Delivery of Individual Training | Link |
| DTSM 5 | Evaluation of Individual Training | Link |

# Introduction to Evaluation of Training

## Introduction

1. This DTSMs provides Guidance on the processes and outputs associated with the evaluation of individual training.
2. Evaluation activities do not focus solely on the provision of training (although this is a key activity) but also on the DSAT process and the Training System as a whole, including the Management Training System (MTS). In addition to evaluation, Element 4 activities includes Training Needs Evaluation (TNE) which is Stage 3 of the Training Needs Analysis (TNA). Evaluation activities are detailed in the Training Quality Manual (TQM) which is endorsed at the Customer Executive Board (CEB). The DSAT Quaity Management System (QMS) is key to assisting those involved in the evaluation of Defence training. The DSAT QMS is the standard that is met when the outputs of the DSAT Elements and the MTS activities are delivered correctly.
3. The evaluation activities covered by this DTSM are:
   1. **TNA, Stage 3 – TNE -** This assesses and reports on the effectiveness of the TNA process as well as the ability of the implemented training solution to meet the Defence requirement. The TNE is conducted in 2 parts: evaluation of the process and evaluation of the training solution. The key output is an assessment of how well the TNA outputs contributed to the provision of a training solution that meets the Defence requirement. This completes the TNA process.

Further guidance on the TNE will appear in a future edition / version of this DTSM.

* 1. **Evaluation Strategy (EStrat).** The EStrat is a long-term action plan for achieving successful training, which details what training will be evaluated and how.
  2. **Internal Validation (InVal) and External Validation (ExVal).** A specific sub-set of evaluation is Validation which is further split into InVal and ExVal. InVal examines whether the Training Objectives (TOs) are being met and ExVal uses both qualitative and quantitative data to determine the degree to which training prepares individuals for the specified Role and whether the Role remains valid.

1. **Responsibilities**. The following are most likely to fulfil these roles/activities1:

### Training Requirements Authority (TRA):

* + 1. TNE.
    2. EStrat.
    3. ExVal of the training activity.

1 Any deviation from the recommended delineation of responsibilities detailed on the DSAT Hierarchy of Activities should be recorded on the TrAD.

### Training Provider (TP):

* 1. InVal based upon the EStrat written by the TRA.

# Evaluation Strategy

1. Writing an Evaluation Strategy is a key activity that is the responsibility of the TRA. Evaluation is defined as ‘the process of making a judgement as to the worth of training to Defence. It allows Defence to monitor the impact of training and assess what has been achieved, whether it was effective, efficient (i.e. represents VfM) and how it contributed to the achievement of Defence outputs’. Evaluation processes and procedures should ensure that training is:
   1. **Efficient and effective.** The input effort to deliver the training should be the minimum required to meet the output standard which should meet Defence’s requirements.
   2. **Focused.** The training should be focused on operational/business goals. The trained output should be able to perform their job competently.
   3. **Necessary.** A requirement for training must be identified.
   4. **Flexible.** The training must be responsive to a change in circumstances.
   5. **Appropriate.** The training product should match the employment need.
2. The Evaluation Strategy is likely to include these individual elements, which collectively make up the whole approach to evaluation:
   1. **InVal.** Conducted by the Training Provider.
   2. **ExVal.** Conducted by the TRA.
3. Kirkpatrick’s evaluation model 2 is a goal-based evaluation model that divides evaluation into 4 levels of measurement: Reaction, Learning, Behaviour and Results. In a Defence context, it would be useful to ask the following questions:
   1. **Level 1 - Reaction.** Did the trainee perceive the training as useful when compared to their expectations? This question is answered through InVal.
   2. **Level 2 - Learning.** Were new Skills and Knowledge acquired and Attitudes developed? This question is answered through InVal.
   3. **Level 3 - Behaviour.** Has Behaviour changed as a consequence of training and can this be measured when the individual is carrying out the Role? This question is answered through ExVal.
   4. **Level 4 - Results.** Was there a measurable impact on business performance and was Value for Money (VfM) achieved? This question can be answered partially through ExVal if agreed training costs are available.

2 Kirkpatrick, D.L. (1967), Evaluation of Training in, ‘Training and Development Handbook,’ edited by Craig,

R.L. and Bittel, L.R. London: McGraw Hill.

1. In devising an Evaluation Strategy the TRA develops a long-term action plan for achieving successful training. This requires the development of a strategy which aims to assess the total worth of a training activity.
2. An Evaluation Strategy should therefore articulate the training to be evaluated, the types of evaluation to be applied and the roles and responsibilities of the people involved in the process. The Strategy should cover the whole cycle of training, starting when a training need is first identified and continuing until the required Defence outputs are achieved.
3. It is not always necessary, beneficial or possible to evaluate all activities. The TRA should define those areas to be targeted in their Evaluation Strategy and define the link to the requirement.
4. For all types of training, the Evaluation Strategy is based upon the 4 Stages of Evaluation in Defence as outlined in Table 2.

|  |  |  |  |
| --- | --- | --- | --- |
| **Stage** | **Function** | **Purpose** | **Benefit** |
| 1 | **InVal**. Measure the immediate reaction of the trainee | To measure the perceived effectiveness of the training activity | Improved efficiency and effectiveness of the training activity |
| 2 | **InVal**. Measure the learning transfer achieved by the training activity | To determine, by applying quantitative or qualitative assessment methods, to what extent trainees increased their Knowledge and Skills and changed their Attitudes (KSA) | Improved efficiency and effectiveness of the training activity and measurement of the Standard achieved by the trainee |
| 3 | **ExVal**. Measure changes in Behaviour of trainees as a result of the training activity and how well the KSA have prepared trainees for their Role. Measure if the requirement is still valid | To determine the subsequent impact on performance after the training activity and therefore the validity of the training in preparing trainees for their Role. To ensure the requirement is still valid. | Improved efficiency and effectiveness of the Defence through the employment of competent personnel |
| 4 | **ExVal**. Measure the contribution of training to the achievement of business/operational goals | Overall organisational benefits attributed to training. | Assurance that the effective business/operational focus of training is being maintained and that the investment has had the desired effect and, where possible, VfM is measured. |

*Table 2: The 4 Stages of Evaluation in Defence*

1. When planning evaluation activity the following factors should be considered:
   1. **Importance/impact.** The actual or perceived impact of the training activity on Defence performance.
   2. **Cost.** The cost of the evaluation compared to the realised or potential/perceived benefit of the training activity.
   3. **Outputs.** Utility of the outputs of evaluation (e.g. can the results of the evaluation be used to improve the effectiveness and efficiency of the training?).
   4. **Frequency.** The frequency of the training activity.
   5. **Availability.** The availability of evaluation data.
   6. **Feedback.** Feedback from InVal or ExVal that requires further investigation.
2. The benefits of adopting and implementing an Evaluation Strategy are various. Examples are:
   1. Clear communication and strategic direction for the evaluation of training.
   2. A framework from which the TRA can readily ascertain and/or demonstrate whether training is effectively contributing to the achievement of Defence outputs. More specifically, it assists the TRA, TDA or Training Provider to:
      1. Ascertain whether training is meeting Defence’s needs.
      2. Ascertain whether training is being delivered efficiently and effectively.
      3. Ascertain whether the refresher training strategies were successful.
      4. Quantify the learning transfer achieved by the training activity.
      5. Identify a consistent baseline against which to measure benefits.
3. **Responsibilities.** The production of the Evaluation Strategy is the responsibility of the TRA and should be set out in the TQM (Element 3, 5.13).
4. **Developing an Evaluation Strategy.** An Evaluation Strategy will involve the systematic collection and interpretation of evidence leading, as part of the process, to a judgement of value with a view to action. The term ‘systematic’ implies that the required information is defined at the outset; ‘interpretation of evidence’ and ‘judgement of value’ introduce a critical consideration; and ‘with a view to action’ highlights that evaluations are intended to provide recommendations for the modification and improvement of training. Any Evaluation Strategy, therefore, should:
   1. be systematic.
   2. ensure provision of a critical analysis of current training.
   3. be linked to risk management to enable review of mitigation strategies.
   4. give a clear indication of improvements to training.
5. Ultimately, the Evaluation Strategy should be appropriate, proportionate, responsive and targeted on the needs of the Defence to help ensure that the costs of the evaluation activities do not outweigh the benefits. It should state:
   1. The evaluation stages to be applied to each training activity.
   2. The frequency with which each evaluation stage should be applied.
   3. The responsibilities of the various stakeholders at each stage of evaluation.
   4. The sources from which information will be obtained.
   5. The methods of data recording and analysis.
   6. The reports that will be raised.
   7. The staffing chain for addressing report recommendations.

# Internal Validation

The policy in JSP 822 says:

* Internal Validation is a ‘**MUST’** activity.

1. **InVal – 4.1.1.** InVal is a process used by the Training Provider to determine the efficiency and effectiveness of training delivery. To achieve this, InVal measures:
   1. The immediate reaction of a trainee to a training activity (Evaluation Stage 1; see Table 2).
   2. The learning transfer achieved by the training activity (Evaluation Stage 2; see Table 2).
2. **Responsibilities.** The Training Provider is responsible for the conduct of the InVal process which involves personnel from a range of backgrounds including trainers and trainees:
   1. **Trainer.** Trainers have responsibility for day-to-day management of the InVal process including management of the AStrat and feedback mechanisms used during the training activity. Trainers also inform the InVal process through the provision of post-training feedback.
   2. **Trainee.** Trainees provide the primary source of feedback, through both test results and feedback, for the InVal process. The information is usually gathered through the completion of a questionnaire or through response to questions posed during a post training discussion or individual interview. In addition, the assessment of trainee Performance will provide data which can be used to measure the transfer of learning.
   3. **InVal team.** At large training establishments InVal teams may be tasked to conduct the InVal process. InVal teams offer the advantage of impartiality and can provide a ‘big picture’ overview of training effectiveness.
3. **Sources of data.** There are numerous sources of InVal data:
   1. **Training documentation.** Training documentation should be checked to ascertain that all Standards from the TOs have been transferred to the LSpecs, that the AStrat includes the testing of all TOs and that any lesson plans (or equivalent) comply with the LSpecs.
   2. **Formative**3 **and summative**4 **tests.** Tests may be practical, written or oral in nature and can be used to ascertain that the trainees have assimilated the KSA

3 Formative assessments are conducted during training to identify any weakness in learning or training and to aid the retention of successful learning.

4 Summative assessments are designed to measure achievement at the end of a period of training.

required to achieve the Standard as specified in the TOs. They can also be used to diagnose the strengths and weaknesses of trainees and test potential success, progress and achievement. An unusually high number of failures may indicate faults with the Training System rather than trainee performance.

* 1. **Trainer performance monitoring.** Trainer performance monitoring can be used to ensure that training is being delivered in accordance with the LSpecs.
  2. **Trainee logs**. Trainees can be requested to complete logs on either a daily or weekly basis and should be required to submit written feedback regarding the training they have received.
  3. **Observations.** The observation of procedures is especially important in Skills training and relates particularly to the areas of speed, sequencing, manual dexterity and safety. Observations can take either a structured form, requiring the use of coded schedules, or can be unstructured, where the trainer uses their judgement about which events are considered important.
  4. **Feedback questionnaires.** Questionnaires can be used to capture trainee opinion on any aspect of training. They can be used to collect both qualitative and quantitative data. Timing needs to be considered to reduce the chance of trainees forgetting information. Questionnaires can also be used to gather information from trainers.
  5. **Post training discussions.** A discussion, or focus group, at the end of training enables trainees to air their views, to amplify comments made on questionnaires and for the trainers to gauge the initial reaction to training. It is considered appropriate to use staff who have not been involved with the delivery of the training activity to manage and conduct the discussion process. If ‘external’ staff are used in this way it may not be possible for these staff to answer questions or criticisms and this must therefore be done by the Training Provider. Irrespective of who conducts the discussion, the content of the discussion should be planned as for any interview, producing an aid or schedule to follow. Information from other sources will suggest the areas needing more/less attention or none at all and can include:
     1. The collated responses to the questionnaire.
     2. Reports from preceding training.
     3. Past problem areas.
     4. Issues raised by unsolicited or informal feedback.
     5. Analysis of assessment results.
  6. **Interviews.** Interviews can be conducted in order to collect trainees’ reactions to training. They have the advantage of being flexible and allow subjects to be explored in depth. However, interviews can be time consuming and are normally only used to obtain opinions from small numbers of trainees and trainers. Interviews can take both structured and unstructured forms.
  7. **Unsolicited feedback.** Unsolicited feedback may come from trainees, trainers and training support staff through involvement in informal discussions. Data

gathered through this means can be used to usefully inform the InVal process and should not be treated in isolation.

* 1. **Other tools.** In addition to the tools listed, activities such as audits of the Training System and management reports can provide useful additional data to inform an InVal.

1. **Timing**. The data required to inform the InVal process can be collected before, during, or at the end of, the training process:
   1. **Before training starts.** When specifying the content of a training activity, it may be necessary to establish what the trainees already know, or what trainees can do, by means of pre-course diagnostic testing. Failure to recognise that trainees can perform certain tasks or possess certain Knowledge can result in training that is inefficient or irrelevant. It is also important to gauge trainee expectations. These tasks can be achieved through completion of a pre-course questionnaire or a pre- course discussion with the information gained used by trainers to enhance the relevance of the training.

### During training.

* + 1. **Measuring learning transfer.** Formative assessments are conducted during training and can be used to measure the learning transfer. Assessing trainee performance during training enables training problems to be identified and dealt with as they arise and allows the Training Provider the opportunity to measure trainee progression towards the achievement of TOs.
    2. **Trainee reaction.** Trainee reaction to the training that has been received can be captured during, as well as after, training. Questionnaires, logbooks and unsolicited feedback are methods through which trainee reactions can be captured.

### At the end of training.

* + 1. **Measuring learning transfer.** The testing and assessment of trainees at the end of training provides a vital indicator of overall training effectiveness. The results of summative assessment can be used to help the Training Provider identify which areas of an activity caused trainees difficulties; they can also be used for assessing the effectiveness of the Training System as a whole. An essential element of the InVal process is the analysis of test results in order to assess the effectiveness of the tests themselves.
    2. **Trainee reaction.** Feedback mechanisms, such as questionnaire- based critiques, and post training discussions, can provide information against which trainee reactions to training can be gauged. Trainee assessment results, coupled with reaction to training, will allow trainers to evaluate trainee performance and will facilitate the formulation of judgements regarding overall training effectiveness.
  1. **Analysis of data.** The InVal process can generate considerable qualitative and quantitative feedback, some of which may be contradictory. In order to ensure that any changes made to training are positive, it is essential that a robust analysis of

feedback data is implemented. When analysing data it is important that an analyst is familiar with the concepts of validity, reliability and triangulation:

* 1. **Validity.** A measuring instrument is valid if it measures what it is intended to measure. For example, in training the most valid measuring instrument for a practical Skill is a practical test. A written test may well test whether the trainee knows what to do in a practical task but not if they can actually do it.
  2. **Reliability.** A measuring instrument is reliable if it gives consistent results. For example, a test or questionnaire, when administered to two very similar groups, would not be reliable unless it gave similar results. If it is a reliable measuring instrument it should also give similar results when it is administered twice to the same group at different times.
  3. **Triangulation.** The term triangulation is used to describe the use of 2 or more data gathering techniques to investigate the same phenomenon. Confidence in the findings is enhanced when the techniques yield similar results. For example, if the outcomes of a questionnaire-based survey correspond to the findings of an observational study of the same phenomena, the more the analyst will be confident of the findings. In addition to the use of 2 or more data collection tools, triangulation can also be achieved using 2 or more analysts using the same research instrument.

1. **Factors that influence trainees’ reaction to training.** Despite the evaluators' best efforts to design feedback mechanisms which are both reliable and valid, it is important to realise that there is a range of external factors that may influence the content of InVal feedback. Every attempt should be made to take these into consideration when conducting an analysis. For example, trainees' reactions to training can be influenced by many factors, including:
   1. Their relationship with their trainer.
   2. Their attitude towards attending the training.
   3. The influence of peers.
   4. How hard or easy they found the training.
   5. The perceived relevance of the training.
   6. The quality of the delivery of the training.
2. **Presentation of findings.** Once data has been gathered and analysed, it becomes evidence to support the conclusions and recommendations of the InVal. It should, therefore, be summarised and incorporated into a report, although it may be appropriate to hold a meeting of stakeholders and record the findings in minutes. For a training activity to be deemed internally valid it must be proven, by triangulation of data, that all training and testing meets the requirements of the TOs as contained in the FTS. For the InVal teams to be able to identify a course as being internally valid they must be able to positively state that:
   1. All Standards have been transferred from the TOs in the FTS to the LSpecs.
   2. The trainers are training to the LSpecs.
   3. Training is being delivered to the correct Standards and Conditions.
   4. The TOs are being tested to the correct Standards and Conditions as per the ASpec.
   5. The trainees have assimilated the Knowledge and Skills to achieve the required Performance.
3. The InVal report is primarily an internal document but it can also be distributed to those responsible for conducting ExVal where appropriate. The InVal report should be used as a management document to identify where, or indeed if, changes to training should take place. It may also form useful evidence for any major changes to the Training System which would be discussed at the appropriate governance body (such as the CEB). InVals also form part of the MTS and contribute to ensuring that the Training System meets the Defence mandated QMS.

# External Validation

The policy in JSP 822 says:

* External Validation is a ‘**MUST’** activity

1. ExVal uses both qualitative and quantitative data to determine whether the training remains relevant to the workplace or role. ExVal should also measure business improvements. ExVal is applied after trainees have completed a training activity and have had the opportunity to apply what they have learnt in the workplace. ExVal measures:
   1. The changes in Behaviour of trainees as a result of the training and how well the KSA have prepared trainees for their Role; and whether the requirement is still valid (Evaluation Stage 3; see Table 2).
   2. The contribution of training to the achievement of business/operational goals (Evaluation Stage 4; see Table 2).
2. **Aims.** The first aim of ExVal (Stage 3) is to determine the success of training in preparing individuals for their Role and whether the requirement is still valid. The following must be considered:
   1. **Timing.** Initially, after training, an individual’s motivation will be increased. Performance, however, frequently suffers as people try to ‘unlearn’ old behaviours and practise new skills. Therefore, the timing of ExVal should be determined by both the length and complexity of the training activity that is being validated. Usually, an ExVal would be implemented between 6-18 months after the completion of training. On the other hand, if too long a period is left between the training event and the ExVal, it will be difficult to ascertain which KSA have been acquired as a result of training and which have been learnt subsequently.
   2. **Methodology.** Some measurement of Behavioural change may have already been made during the assessment of trainee performance during training. However, in order to ascertain the full impact of training on individual performance in the workplace, further analysis must be undertaken. The process through which data is collected and analysed in order to inform ExVal should be planned. This is typically via questionnaire-based feedback mechanisms5. Questionnaires will normally be distributed to both ex-trainees and their respective line managers at least 6 months after the completion of training. The questionnaire should examine the degree to which the TOs relating to a particular training activity remain relevant to the employment area they were designed to support. The questionnaire should also serve as a mechanism through which data can be gathered on wider aspects of the training process, and must be responsive to the needs of all stakeholders. The questionnaire should also give Training Providers a common method of determining

5 Although questionnaires will be the main method of gathering data, the user should not rule out the other tools available, such as minutes of meetings, visit reports and data relating to Role performance that is obtained through observation of the trained individual in the working environment and through interview.

how applicable and effective the training was in affecting the trainees' Role Performance. Data should also be gathered from trainers. Activities such as audits of the training process, trainer monitoring, management reports and other data gathered through the InVal process can all be used to inform ExVal.

1. The aim of Stage 4 Evaluation is to assess overall benefits to the organisation of a particular training activity and whether it offered VfM. This Stage of evaluation is challenging in an organisation the size of the MOD. Defence Performance and Risk reporting mechanisms mean it is possible to measure whether training has directly contributed to Defence outputs by measuring performance against the Defence Board Defence Tasks which are, essentially, Defence’s organisational goals. To evaluate business benefits to the organisation, training should be linked to the Defence Tasks and their subordinate SC objectives. Those conducting Stage 4 Evaluation should bear in mind that there are many other factors external to training which may impact business performance (such as redundancy programmes, leadership in the workplace etc). JSP 507 provides guidance on the evaluation of projects including the assessment of whether VfM was achieved.
2. **Responsibilities.** It is the responsibility of TRA to conduct ExVal. The TRA may employ an ExVal team for the planning, coordination and implementation of the ExVal and for the dissemination of the results. In doing so the team will need to draw on the experiences of many of those involved in the training process who should be encouraged to take individual responsibility for the conduct of ExVal. Wherever such a responsibility is accepted then CI of the training is more likely. The main contributors include:
   1. **Ex-trainees.** Provide information, by questionnaire and/or interview, that informs the ExVal process of their opinions as to how well the training prepared them for their in-Role tasks.
   2. **Line managers.** Ranging from the ex-trainees’ immediate supervisor to their CO (or equivalent), such personnel usually prove to be more objective sources of information as to how the training has prepared the ex-trainee for their Role.
   3. **Subject Matter Experts (SMEs).** Recognised experts in the subject matter for which the training was designed should be identified and consulted. An SME working within a Training Provider should not, however, be disqualified from making a contribution purely on the grounds of their current employment.
3. The methods of gathering and analysing data used in ExVal will vary according to the object, scope and Stage of the ExVal itself. The final ExVal report should be used to identify where, or indeed if, changes to training should take place. It may also form useful evidence for any major changes to the Training System which would be discussed at the appropriate governance body (such as the CEB). ExVals also form part of the MTS and contribute to ensuring that the Training System meets the Defence mandated QMS.

# Data Gathering and Analysis

1. There are a variety of data gathering tools and analysis techniques that are available to assist with Assurance, particularly InVal and ExVal. This Guidance aims to present the tools and techniques available along, the advantages and disadvantages each brings and some considerations for the analysis of data.

### Characteristics of data gathering tools

1. The characteristics that all measuring instruments should possess are:
   1. **Validity.** A measuring instrument is valid; that is, relevant and appropriate, if it measures what it is intended to measure. In training, the most valid measuring instrument for a practical skill is a practical test. A written test may well test whether the trainee knows what to do in a practical task, but will not test whether the trainee can actually do it. The written test is not valid because it is measuring the wrong thing. If a measuring instrument is not valid it should not be used however effective its other characteristics.
   2. **Reliability.** A measuring instrument is reliable if it gives consistent results when the same entities are measured under the same conditions. If it is a reliable measuring instrument it should also give similar results when it is administered twice to the same group at different times (i.e. test/re-test reliability). If a test, questionnaire, report form or interview is not reliable it should not be used.
   3. **Standardised Conditions.** The conditions under which a measuring instrument is used should be standardised. If the administration of the same test on two separate occasions is likely to bias responses, due to a learning effect, then it is possible to develop an alternate form of the test. Alternate form reliability, however, would need to be demonstrated.
   4. **Discrimination.** A measuring instrument should be sensitive enough to record differences between individuals in what is being measured. Similarly, the inability to discriminate between satisfactory and unsatisfactory training is of no use.
   5. **Practicability.** Any assessment of training must be administratively practicable. A theoretically superb assessment system is of no use if practical limitations, such as time, cost or workforce considerations prevent it from being used.

### Factors influencing the choice of data gathering tools

1. The choice of data gathering tools is crucial in determining the effectiveness of the study. Influencing factors can be:
   1. The reason(s) for directing data gathering to be conducted.
   2. The resources allocated to the task (such as, timescale, workforce, funding).
   3. Level of expertise of the analysts.
   4. The size of the Target Population:
      1. Numbers of Role holders6 and supervisors/managers.
      2. Rank/experience.
      3. Trades/skill levels.
      4. Availability of target population/geographical influences. For example, questionnaires may be preferable to face to face interviews for a widely dispersed population in distant locations.
2. The data gathering plan should be produced at an early stage, highlighting the tools, sources of data and resources that will be used. The relative advantages and disadvantages of the main data gathering process are discussed later in Chapter 5.

### Ethical considerations when gathering data

1. There are several ethical considerations that need to be adhered to throughout the data collection process7. The respondents’ right to privacy and the right to refuse to answer certain questions, or to be interviewed at all, should always be respected, and no undue pressure should be brought to bear. The reason for this caution whilst undertaking data collection is not only for the interviewee’s benefit but also for the interviewer’s. If an interviewee believes that answering questions honestly will harm them then they are more likely to give bland, misleading and uninformative answers. Any evaluation based on such data is invalid. When conducting interviews a manner conducive to following sound ethical considerations should be followed. Examples are:
   1. **Honesty.** The interviewer should portray a non-threatening manner and remain truthful and faithful to the purpose of the interview. This ensures that the interviewee also gives honest answers to any questions.
   2. **Impartiality.** Regardless of the analyst’s own particular viewpoint, an interview or questionnaire analysis should remain objective, valid, reliable and accurate. No attempt should be made to persuade a respondent to agree with the analyst’s perspective. For example, an interviewer must be careful not to ask leading questions.
   3. **Relevance.** The reason for the data collection and the target population is to be made clear. The data collection tool must be objective and economic with the respondent’s time. For example, an interview should be concise and focused. Rushed interviews with irrelevant questions reduce the credibility of the interviewer and the reliability of the data gathered.
   4. **Confidentiality.** If the data collected is to remain confidential, and the analyst has stated this, then confidentiality must be observed. If the respondent wishes to remain anonymous and if the analyst agrees then this agreement must also be observed. It may also be important that it is explained who will see the data collected and the analysis of the collected data. Such openness on the part of the analyst leads to respondents being equally open.

6 For the purpose of this Guidance the terms ‘role holder’ and ‘ex-trainee’ are synonymous.

7 The [Defence Logistics Framework](https://dlf.defencegateway.mod.uk/PrimaryElements/0/08D1810B5E97469682A081B5AB31A012.htm) provides further guidance.

* 1. **Anonymity.** Consideration needs to be given when anonymity is to be used. If follow up interviews are to be undertaken as a result of the data gathered from questionnaires then it is important to have those details of individuals filling in the questionnaire. Consequently, the reason for the lack of anonymity should be stated as part of the instruction to the questionnaire. Additionally, individuals are more likely to complete questionnaires if they know what is going to happen with the data collected. If there is no requirement to know who has completed a questionnaire or interview then anonymity is recommended.
  2. **Control of data.** Data should be utilised in accordance with the Data Protection Act (DPA) 2018. The DPA sets standards for protecting general data, in accordance with the GDPR, giving people more control over the use of their data, and providing them with new rights to move or delete personal data. Further information about the DPA and GDPR is available at [www.gov.uk/government/collections/data-protection-act-2018](http://www.gov.uk/government/collections/data-protection-act-2018) .

### Data gathering methods

1. **Quantitative data gathering.** Quantitative data are gathered using closed questions (yes/no or scored answers). A relatively simple easy way of processing quantitative data is through some form of frequency statement which requires the use of standardised measures so that the varying perspectives and experiences of respondents can be identified by a number of predetermined response categories. A numerical value is then assigned to each category.
2. **Qualitative data gathering.** Qualitative data can be defined as data gathered on individuals’, feelings, opinions, beliefs etc using open ended questioning. Qualitative methods allow the study of selective issues in depth and detail. Qualitative data consist of detailed textual information rather than numerical information generated by quantitative techniques. Qualitative data can be generated from 3 main types of data collections:
   1. **Questionnaires/written documents.** Document analysis in qualitative terms includes excerpts, quotations or passages from organisational records and open- ended written responses to questionnaires and surveys.
   2. **Direct observation.** The data from observations consist of detailed descriptions of operators’ activities, behaviours, actions that are part of observable human experience.
   3. **Interviews.** The data from interviews consist of quotations from respondents about their experiences, opinions, feelings and knowledge. These aspects are elicited using open-ended questioning and can be used to confirm/clarify data obtained as referenced above.

### Piloting

1. The aims of piloting are to allow:
   1. The systematic gathering of information to confirm validity of data gathering tools.
   2. The identification of technical inaccuracies and faults.
2. **Testing the questions.** When piloting (testing) the questions these points should be borne in mind:
   1. The question should involve only one idea.
   2. The question should be worded as simply as possible in light of the ability of the target group.
   3. The question should be as brief as possible.
   4. The question should be as direct as possible.
   5. The question should allow the respondent to admit lack of knowledge without loss of face.
   6. The question should be positively phrased - not looking for negative response.
   7. The question should not influence the response.
3. **Piloting process.** For questionnaires, when the initial construction is complete, in addition to testing the questions, the questionnaire must be piloted as follows:
   1. The questionnaire is completed by an individual under the close supervision and with the assistance of the designer. Any difficulties found or comments made by the person completing it should be noted. The individual chosen should be either a member of the group for whom the questionnaire is intended, or as much like the members of this group as possible. Ideally, this procedure should be carried out a number of times with different people.
   2. The questionnaire is amended to solve problems and ambiguities found in the first stage.
   3. The amended questionnaire is then completed under the same conditions that will prevail when it is eventually administered. Again, members of the group used should be as near as possible to those for whom the questionnaire is intended. The respondents should be asked for comments or criticisms after they have completed the questionnaire.
   4. The questionnaire is amended to eliminate any difficulties or ambiguities remaining. Analysis of the answers given should assist in indicating any inconsistencies in answers that may be the fault of the questionnaire.
4. **Outcomes.** Only after effective piloting can the questionnaire be considered ready for use. Even then the questionnaire will not be perfect. Answers given and comments made by those completing the questionnaire will indicate, in some cases, that further amendments are required:
   1. If the structure of the design does not need any alteration following the pilot, then information obtained from the pilot can be used as part of the population data. However, where the population is to be analysed by sampling in order to prevent any misrepresentation or confusion, the data-gathering pilot should be conducted on a separate sample of the population.
   2. Once the objective(s) of the study has/have clearly been stated, including sample/population size and the quality and type of information to be received (qualitative and quantitative), the process of establishing the data gathering techniques can begin.
5. **Sources of information.** When conducting a pilot careful consideration should be given as to who would be the best source of information for particular areas:
   1. Subject Matter Experts (SME) and trainers can provide useful feedback in respect of the technical content included in the interview/questionnaire and the language used.
   2. Representative operators can be used to review the responses already obtained from SME input. In addition they can also provide information on:
      1. Operator reaction.
      2. Ease of completion.
      3. Sequence of activities.
      4. Time taken to complete questionnaire.
      5. Depth of response required.
6. **Piloting pre-requisites.** There are certain pre-requisites for piloting when carrying out a study:
   1. High cost.
   2. Large target population.
   3. Complex subject matter.
   4. Tasks of a critical nature.

### Choice of data gathering techniques

1. Once the objective(s) of the research have been clearly stated, including the sample/population size and the quality and type of information to be received (either qualitative or quantitative data), then the process of establishing the technique to be employed to gather the data can begin. The choice of data gathering technique(s) will depend on the sample size, resource implications and many other factors. In all cases the data gathering method should be fit for purpose and developed by suitably qualified and experienced personnel.
2. **Questionnaire.** A questionnaire can be used to cover a large number of people at relatively low cost and the data it provides is generally easy to analyse. However, questionnaires are difficult to design, are resource intensive and require piloting and pre- testing to ensure that they are collecting the right types of information. Questionnaires do not always allow great flexibility, may not be completed by the recipient, and response rates are not always as high as the team doing the analysis would wish.
3. **Interview.** Data can be gathered from Role holders and their employers by interview. While the interview allows the personal touch to be brought to the analysis process, and its inherent flexibility, care needs to be taken to avoid bias. The process is time-consuming and data analysis can be difficult.
4. **Observation.** Observation of personnel carrying out their tasks can also provide useful information but it is a very labour-intensive means of acquiring data. It is usually limited by the range of tasks being undertaken and can be misleading if the observer is unfamiliar with the task.
5. **Document research.** When conducting a study it may be necessary to consult documents such as interim reports from on-going related studies, exercise reports, operational reports, current training documentation, doctrine and policy documents and manufacturer’s manuals.
6. **A conference of experts.** This is sometimes known as a Technical Conference or Focus Group and is held when it is necessary to discuss the nature of the Role with others who are experts in that particular field. In some cases this may be the only data gathering method available or needed. It produces quick results, but the problem with experts is that they tend to overlook routine aspects of a Role that could present problems to the non- expert. This method can also be used to analyse findings (e.g. from questionnaires).
7. **Critical incident technique.** The critical incident technique is the procedure for collecting observed incidents that have proven very important or critical to performance. It has been used extensively in civilian flight safety investigations and can be used to provide data on the relevance of training to performance of the Role or task. However, this technique can be very lengthy and labour intensive when used to identify the whole spectrum of tasks that make up a particular Role.

### Questionnaires

1. Questionnaires can gather qualitative and quantitative information and are very useful in both InVal and ExVal. Questionnaires sent to ex-trainees sometime after their course can provide useful information about the relevance of training. Questionnaires should be sent out on a routine basis to ex-trainees and their supervisors at an appropriate period on completion of training (normally 6-9 months). This type of questionnaire looks all the tasks conducted, addressing:
   1. Do the operators carry out the tasks for which they were trained?
   2. How well were the operators trained for these tasks?
   3. Do the operators carry out any other tasks for which they were not trained?
2. **Constructing a questionnaire.** When producing a questionnaire these points should be borne in mind:
   1. **Introduction/rapport.** The introduction, or covering letter, to the questionnaire is very important, because unless the full co-operation of the respondent is obtained the results are useless. To ensure willing co-operation, the questionnaire should create and maintain rapport with the respondent. The purpose of the questionnaire should be explained whether in a written introduction or by the

person administering the questionnaire. It should be made clear that respondents’ opinions are valued and could make a difference to the results of the project.

* 1. **Presentation.** The questionnaire should look well prepared and be easy to complete.
  2. **Instructions.** Instructions on how to complete the questions should be simple, clear and concise.
  3. **Language.** The language used in questions asking for criticisms should be impersonal and permit the expression of frank replies.
  4. **Questions.** Questions should be:
     1. As short as comprehensive coverage allows and must be relevant to the information required.
     2. In a logical sequence. Questions relating to a specific subject should be placed together.
     3. Precise and specific. Vague questions will lead to vague responses due to different interpretation. If a group of questions does not apply to everyone it must be made apparent who is to answer them. Filtering of questions is recommended.
     4. Capable of being answered. Respondents must be capable of answering the questions and have adequate knowledge/experience to provide meaningful responses.
  5. **Confidentiality.** Respondents must be reassured that the questionnaire will be treated in strict confidence and that completed questionnaires will only be seen by the analysis team and destroyed once analysis is completed.
  6. **Clarification.** Provide a contact name and telephone number for any queries. Include a date for completion and return of the questionnaire.
  7. **Details.** One part of the questionnaire from which the analyst can obtain useful data is the element on personal details. In deciding what personal details are required, the analyst will be guided by the requirement of the analysis. The analyst must ensure that the questionnaire asks for all the details that will provide meaningful data for the analysis, while at the same time not asking for details that are clearly irrelevant to the analysis, as by doing so this may tend to alienate some respondents. If the analyst requires some particular detail, but considers that the respondent may not realise why it is required, the analyst must explain the reason behind asking for the information. Increasing the degree of openness of the potential response received can be achieved by offering anonymity (discussed earlier) by not including clearly attributable details in the personal details. However, if anonymity is quoted it must be honoured. Questions over confidentiality cannot only taint the study but may also negate the chance for further open and honest dialogue.
  8. **Dangerous questions.** There are certain types of questions which should be regarded as ‘dangerous’, producing inaccurate and immeasurable answers, or, at best, vague responses which can easily be misinterpreted:
     1. **Multiple questions.** These have a variety of responses ‘Yes/Yes’ ‘Yes/No’ ‘No/Yes’ ‘No/No’. For example ‘Are you supervised at work and do you rely on manuals?
     2. **Negative questions.** These are difficult to understand and it is unclear what the response means. For example to answer ‘No’ to the question ‘Would you prefer not to have to account for this equipment?’ is confusing. Questions are more readily understood if phrased in the positive. For example ‘Do you think you should account for this equipment?’
     3. **Leading questions.** Beginning the question with words such as ‘It’s obvious that...’ can influence the respondent’s reply. In the closed question format, limiting the fields of response to ‘Very Interesting’ ‘Interesting’ and ‘of some interest’ steers the respondent away from the response ‘Tedious’.
     4. **Loaded questions.** These are similar to leading questions but tend to have an emotional overtone, for example ‘Have you stopped cheating in tests?’ and ‘Which aspects of your training were irrelevant?’
     5. **Prestige bias questions.** Some questions may tempt the respondents to reply in a way that will present them in the strongest light, hence there might be a reluctance to admit that certain tasks are difficult or never carried out.

1. **Anonymous questionnaires.** Making the questionnaire anonymous (not adding clearly identifiable details which can be traced) has the advantage of encouraging more candid responses, increasing the degree of openness. However, its main drawback is that it is not possible to analyse the responses further, through follow up interviews. If anonymity is promised it must be honoured. Questions over confidentiality not only taint the study, but also negate the opportunity for further open and objective dialogue.
2. **Advantages and disadvantages of questionnaires.** When gathering data using written questionnaires analysts must be aware of the respective advantages and disadvantages:

### Advantages:

* + 1. Relatively cheap way of data collection.
    2. Large target population.
    3. Largely objective although there could be bias in analysis of qualitative responses.
    4. Potential to automate data entry and analysis.
    5. Can be anonymous.
    6. Questions can be asked in a consistent manner.

### Disadvantages:

* + 1. No guarantee of respondent identity.
    2. Response rate may be low.
    3. Impersonal - difficult to establish a rapport with respondent.
    4. May be limited by length.
    5. Investment needed to develop and pilot the questionnaire.

### Interviews

1. **Purpose.** An interview is not an aimless chat but a method of obtaining specific information. An interviewer must work out beforehand what information is required; otherwise, the interview will be ineffective and a waste of time. The questions should be incorporated into an interview schedule, which will:
   1. Remind the interviewer of the areas that must be covered.
   2. Provide a framework for the interview and ensure that data are collected in a systematic and standardised way.
2. Interviews can be structured, semi-structured or unstructured (open ended); this refers to the degree to which the interviewer follows prescribed questions or deviates using prompts to gain further information from the interviewee. Generally, the more structured the interview, the more comparisons can be drawn between responses. However, unstructured interviews can provide richer data and may be useful if the interviewer has only a limited knowledge about the subject matter of the interview.
3. Interviews involve going outside the immediate training organisation to interview employing officers and ex-trainees at all levels in field units. Gaining entry to these units and access to those who are required for interview needs careful planning and proper authority. The question of the appropriate ranks of interviewer and interviewee should also be considered.
4. **The interview schedule.** The interview schedule can be regarded as a verbal questionnaire but differs from the written questionnaire in that the instructions are for the interviewer not the respondent (interviewee). The instructions should indicate:
   1. The amount/level of background information to be provided.
   2. The amount of prompting allowed.
   3. The method(s) of recording and interpreting responses.
5. The instructions should assist the interviewer in conducting the interview allowing them to place a mark against one of the responses already included on the sheet. However, there should be sufficient space to record open responses.
6. **General techniques of interviewing.** An interview is not an interrogation but a relaxed, two way exchange with the interviewer maintaining an open and understanding attitude. The interviewer must not, however, allow the interview to pass from their control. The structure of the interview must be decided beforehand on the basis of the information required. While the interviewer must be flexible and allow the subjects to express themselves, the interviewer must be firm and maintain control.
7. **Role of the interviewer.** The effective interviewer listens, adapts their approach to what is being said and avoids interpreting what is said to fit in with their own ideas. Interviewing is a skill that must be learned and practised. Although there is no one correct way of conducting an interview, the following guidelines may be of assistance:
   1. **Rapport.** In order to establish good contact with the interviewee, the interviewer needs to:
      1. Decide the purpose of the interview and what is to be gained from it.
      2. Decide the questions to be asked during the interview.
      3. Ensure that any information, reports or data required to back-up the interview are readily available.
      4. Decide when the interview is to take place. Arrange a convenient time for both interviewer and interviewee so that there is no need to rush the interview.
      5. Arrange a suitable location for the interview. Avoid discomfort or distractions. A comfortable room without a telephone is ideal. Telephone interruptions can destroy the relationship built up between the interviewer and interviewee. One of the most irritating distractions is that of people ‘barging in’ during the interview. Prevent this from happening by placing an ‘Interview In Progress - Please Do Not Enter’ notice on the door.
      6. A friendly, sympathetic, but emotionally detached relationship should be established to put the respondent at ease. This should gain their confidence and thus persuade them to talk freely and frankly about themselves.
      7. Whenever a candidate has to wait in another room before the interview, the interviewer should always escort them into the interview room. In this way contact is made in less formal surroundings than the interview room; the rapport thus established can help to smooth the way into the interview itself.
      8. The interviewer(s) should introduce themselves fully.
      9. The interviewee should be told the reason for the interview.
      10. Difficult or controversial topics at the beginning of an interview should be avoided. Allow the interviewee to get used to talking. This can be achieved by starting with an ‘easy to talk about topic’.
   2. **Content.** The interviewer can elicit facts efficiently only if they ask the right sort of questions and pose them in an appropriate manner. The main points to note are:
      1. **Do not read out facts.** Repeating information that is already available in forms or publications wastes time and can antagonise the interviewee.
      2. **Use appropriate language level.** The interviewer should make sure the interviewee understands the questions using the most appropriate vocabulary for the interview.
      3. **Ask one question at a time.** Rambling, multiple questions confuse the interviewee and are difficult to answer. Keep questions simple, unambiguous and to the point.
      4. **Avoid leading questions.** Avoid questions that hint at the answer expected; some interviewees will tend to give the answer they think is wanted.
      5. **Avoid trick questions.** Trick questions that attempt to ‘catch out’ the interviewee provide little information and can endanger the contact that has been built up.
      6. **Use comparative questions.** It is easier for an interviewee to say which of two things does the indiviudal find more difficult than it is for the individual to state how difficult something is in absolute terms.
      7. **Use open questions.** The interviewer should try to use questions beginning with words such as “tell me about...”, “how ...”, “when ...”, “why...”, rather than those which demand a simple “yes” or “no” answer.
   3. **Control.** To ensure that the interview flows smoothly from topic to topic and control is retained, the interviewer should attempt to:
      1. **Avoid interruptions.** Interruptions can cut off the interviewee’s train of thought. The interviewer should interrupt only when necessary in order to avoid digression, or to regain control.
      2. **Use pauses wisely.** Do not rush to fill any pauses that may occur in an interview with another question. Pauses give both interviewer and interviewee a chance to consider what has been said and the interviewee may spontaneously continue with further information.
      3. **Handle delicate issues carefully.** On occasion it may be necessary to ask questions about topics which are emotionally charged or which may cause distress or embarrassment. These topics should be left until effective rapport has been established, introduced when a natural opportunity occurs and discussed in an open, objective, but tactful way.
      4. **Summarise.** It is useful occasionally to summarise what has been covered. This helps ensure that all the relevant points are covered and that the interviewee’s statements have been understood.
      5. **Be flexible.** The main advantage of the interview is its flexibility in that points can be followed up as and when they arise. This advantage will be lost if the interviewer follows a preconceived plan rigidly and without reference to what has been said. The interviewer must:
         1. Be prepared to adapt themselves to the natural flow of the interview.
         2. Follow up leads as necessary.
         3. Ensure that, in the end, all the information required has been obtained that is needed.
      6. **Recording Responses.** It is impossible to remember everything that was said in an interview. To avoid later distortion, interviewers must try to record responses during the interview, without breaking contact with the interviewer.
      7. **Beware of bias.** The purpose of the interview is to collect information as accurately and objectively as possible. The interviewer should guard against introducing bias by interpreting the replies to fit in with their preconceived ideas. It is also important to avoid biasing the replies by expressing approval/censure. The interviewer must suppress their own opinions and feelings and help the flow of conversation with neutral phrases such as “good”, “I see” or “go on”.
      8. **Interviewee questions.** After answering a series of questions it is reasonable to allow the interviewee to ask some of their own. These should be answered before ending the interview.
      9. **Thank interviewees.** Finally, end the interview on the right note and thank the interviewee for their help and information. Remember that it may be necessary to interview them again at a later date.
8. **Interviewing techniques checklist.** The following list is a summary of points to consider when conducting an interview as part of the data gathering process.

### Contact:

* + 1. Be prepared: ‘read in and ready’.
    2. Ensure a suitable environment.
    3. In time and enough time.
    4. Introduce yourself (if necessary).
    5. Be pleasant but not too amiable.
    6. Make sure the interviewee knows the object of the interview.
    7. Reduce tension.
    8. Start with an ‘easy to talk about’ topic.

### Content:

* + 1. Do not read out facts from forms.
    2. Use the appropriate language level and adjust as necessary.
    3. Ask one question at a time.
    4. Avoid leading questions.
    5. Avoid trick questions.
    6. Make use of comparative questions.
    7. Use indirect open questions.
    8. Distinguish between skill and enthusiasm.
    9. Explore the reasons for statements.

### Control:

* + 1. Avoid interrupting the interviewee.
    2. Use pauses widely.
    3. Handle delicate issues carefully and as opportunity occurs.
    4. Summarise from time to time.
    5. Be flexible rather than rigid.
    6. Use open, probing then linked questions.
    7. Follow leads given by the interviewee.
    8. Keep a balance between the points of your plan.
    9. Make notes.
    10. Beware of bias.
    11. Avoid ridicule.
    12. Give the interviewee chance to add points at the end.
    13. Answer interviewees’ questions and thank them.

1. **Recording responses.** It is rarely possible to record all that a respondent says during an interview and it would be of little value in any case since all the answers would then appear to be different. What is necessary is the grouping of answers under suitable headings, so that the completed schedule will indicate clearly and concisely what the interviewee may have taken a quarter of an hour to say. It is then appropriate for the interviewer to indicate how the answer has been recorded (e.g. “Am I right in putting you down as saying?”). This gives the respondent time to think again and for the interviewer to check that what has been said has really been understood. If the answer does not fit under an already accepted heading then it must be inserted under a new heading, which will in turn be available for all subsequent interviews. A pocket-dictating machine may be useful but permission must be gained to use one. Recording interviews can also inhibit interviewees.
2. Attempt to transcribe a recording is prohibitive due to the amount of time required. It may be worth considering the use of a second team member to record responses. This will leave the interviewer free to concentrate and develop the interview. A successful interview is dependent upon:
   1. Careful planning.
   2. Good questioning technique.
   3. Establishing an effective good rapport with the interviewee(s).
3. **Advantages and disadvantages of interviews.** Interviews have the advantage of being flexible, allowing subjects not previously considered by the interviewer to be raised and explored. They can be extremely time-consuming, hence they may be used to clarify issues raised from questionnaires for relatively small numbers. A structure must be developed (see Interview Schedule below) to record the strength of opinions given. Interviewers and those analysing the data need to be trained if similar opinions are to be rated by different individuals. Once achieved, information obtained from different interviewers can be compared:

### Advantages:

* + 1. Easier to tailor to the audience. The interviewer can select only those questions that are relevant to a particular situation. This is particularly important when the Role in question is unusual and it would be time- consuming, costly and unacceptably bulky to produce a detailed questionnaire to cover all possibilities.
    2. The interview can be conducted with reasonable speed (depending on circumstances).
    3. Wide range of topics can be covered to required depth. Entirely new points of interest can arise. The interviewer can deal with these immediately and add them to the list of questions to be put to all remaining respondents.
    4. Personal contact can reinforce commitment to study and raise response rate.
    5. The interviewer can check that the respondent has understood technical expressions and terms which have been used in the questionnaire. For example, a term like ‘Defence Writing’ is open to numerous interpretations. To one person it may mean the mechanics of writing, i.e. layout, conventions etc, while to another it concerns matters of style and content.

### Disadvantages:

* + 1. Time intensive - not only the interview itself, but the analysis of data it produces.
    2. Data may be of complex nature requiring structured/thematic analysis.
    3. Requires experienced personnel to conduct the interview.
    4. Lack of objectivity, further to which the relationship between interviewer and respondent can become confrontational limiting transmission of objective information.
    5. Can be influenced by perception - there may be bias for, as well as against, a particular topic.

### Observations

1. **Requirements.** Observation involves watching, recording and analysing. Observing a particular activity is influenced by the fact that human perception is highly subjective. The fact that an individual is equipped with functioning senses does not make that person a skilled observer. Different people looking at the same design or object will see different things, due in part to their interests, biases and backgrounds.
2. **Coding.** The observation may be unstructured, with the person who is observing being as open-minded as possible and using his or her judgement about which events are considered important. Alternatively, it may be highly structured by the use of coded schedules that guide attention to specific types of event. The categories that are selected will be those where changes are expected as a result of training, or those that are thought to be particularly important to the success of the Role. Unstructured observations should be avoided. Use pre-determined criteria to increase the reliability and validity of the data collected.
3. **Advantages and disadvantages of observations.** Observation of procedure is important in the areas of skills training and relates particularly to the areas of speed, sequencing, manual dexterity and safety. As with questionnaires and interviews, to be effective, observations require formal structure in the form of an observation schedule. The advantages and disadvantages of gathering data by observation are highlighted as follows:

### Advantages:

* + 1. Direct experience can be utilised.
    2. Real time analysis.
    3. Can be done without co-operation of operator.
    4. Whole situation of activity is included.
    5. Activity is placed in context - aids understanding.

### Disadvantages:

* + 1. May lack objectivity - influenced by perception.
    2. Potential blizzard of information.
    3. May concentrate on unrepresentative individual(s).
    4. False performance - operators aware of being observed.
    5. Time intensive.

### Reports/logs

1. **Training reports.** These should cover an ex-trainee’s Role performance and should be completed by the employing officer/line manager. Reports should be structured if they are to be of value. Examples of training reports are:
   1. RN: Form S3018.
   2. Army: Training Deficiency Reports.
   3. RAF: Training Improvement Form (TIF).
2. **Open-ended reports.** Open-ended report forms may be administratively feasible, but may suffer from lack of relevance, as the type of comment(s) required may not be clear to a reporting officer. In addition to which they may lack comprehensiveness, due to limitations of space and time. They are usually fragmentary and often misguided. Report forms using rating scales are designed to direct the reporting officer’s attention to specific behaviours. This enables reports of different supervisors to be accurately quantified. The main disadvantage of this method is the restriction it places on reporting officers’ freedom of expression, although this can be mitigated by provision of room for open-ended comments.
3. **Equipment reports.** These can be used to identify equipment malfunctions which may have training implications.
4. **Post Exercise Reports (PXRs).** These can be used to highlight the application of skills acquired during training in a realistic environment
5. **Work records.** A study of the tasks carried out can give a reasonably accurate picture of the performance and the standards involved in a Role. Additional records containing details of time taken, lack of skills, incidence of accidents etc can sometimes complement these, which can be pointers towards areas of training deficiency.
6. **Log books.** The log book can be a valuable source of information. Its main value lies in that it allows a direct comparison to be made between what the ex-trainee is able to do as a result of training and what they are required to do when employed on an operational task.

### Analysing Collected Data

1. **Quantitative and qualitative data analysis.** Quantitative data by their very nature lend themselves to statistical analysis. However, with qualitative data there may be trends (patterns, themes) present, which could go unnoticed. One of the problems of dealing with qualitative data is the ‘blizzard of information’ that can be reproduced. This can often be unstructured in content and resource intensive in terms of workforce and time to analyse. Such considerations need to be included during initial project management planning. In analysing qualitative data the quality of the analyst must be taken into consideration, as unlike quantitative data analysis where the issues are more readily identifiable, qualitative analysis requires greater degree(s) of interpretation. Analysts must be conscious of the possibility of knee jerk reactions when confronting data for the first time
2. Qualitative data allow a vast amount of (potentially wide-ranging) information to be considered, allowing the respondent to provide depth of feeling over complex issues which may be difficult to elicit by purely quantitative terms alone. That said, in order to obtain a full picture, qualitative data should not be treated in isolation, but should be compared with quantitative data.
3. **Triangulation of data.** Triangulation is the combination of different data gathering techniques to investigate the same issue and will usually combine both quantitative and qualitative data methods. For example, rather than simply completing a questionnaire in respect of how an individual performs a task, they might also be interviewed and observed conducting the task. The use of questionnaires together with observation, or qualitative with quantitative data gathering techniques, for example, can reduce the chance of distorting the results or introducing bias within the methodology. To that end triangulation allows greater confidence in the research results regardless of the data gathering methodologies applied.
4. **Information sources.** Collecting data can be gained from a number of different points of view: the Role holders (ex-trainees), the Role holders’ supervisors/line managers and the participant observer. The Role holders can reflect on the adequacy of the training they received; the line managers can comment on their performance when carrying out their Role. The observer can collect first-hand data of the Role holders conducting the Role tasks. Comparing these sources of information enables a more accurate and unbiased method of data gathering.
5. **Data combination.** The combination of different data gathering techniques to investigate a particular issue usually is a combination of both qualitative and quantitative methods:
   1. **Triangulation of analysts.** This uses 3 or more analysts to look at the same set of data independently. If similar findings come from all analysts then it is likely that objectivity is being applied.
   2. **Triangulation of data.** This involves 3 or more types or sets of data and subject them to the same analytical procedures. For example, if interview notes, questionnaire responses and observation notes produce similar findings it is likely that the analytical process is being applied objectively.
   3. **Triangulation of target population.** This concerns 3 or more types of target population. For example, the ex-trainees, their immediate line managers/supervisors, commanding officers and trainers. If similar findings are produced it is highly likely that an objective picture has been achieved.

### Data Coding

1. **Requirement.** Some form of coding (grouping, classification) is required before analysis can begin identifying themes:
   1. All information needs to be read thoroughly to obtain a clear picture of the main issues.
   2. Themes/patterns/trends need to be identified and clearly highlighted.
   3. Repeated instances of these themes need to be recorded in the form of ‘tallys’.
2. These ‘tallys’ can then be recorded as numerical responses allowing follow-on statistical analysis to take place.

# Document Information

## Document Coverage

This DTSM supersedes all previous DTSMs on Governance of Individual Training The totality of DTSMs included in the DTSMs Suite, of which this document is a part, are listed on the DTSMs SharePoint site.

## Document Information

|  |  |
| --- | --- |
| Filename: | Evaluation of Individual Training |
| Document ID: | DTSM 5 |
| Owning Function / Team: | Talent, Skills, Learning and Development (TSLD) |
| Service Owner (1\*): | People-TSLD-Hd OF6 |

## Document Editions / Versions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Edition | Edition Version | Publication Date | Revision History | Revised Pages |
| 2023 | 1.0 | 17/10/2023 | First Edition | N/A |

Annual editions of this DTSM will be published every December in time for upcoming year relevant to the DTSM. Throughout the year, different versions of the current edition may also be published. When every new edition is published, the versions will reset to 1.