A new integrated framework for training needs analysis

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Training and HR professionals consistently emphasise the importance of linking training to relevant results, as is seen by the popularity of literature on both results-oriented training (e.g. Robinson and Robinson, 1989; Rummler and Brache, 1990) and training evaluation (e.g. Brinkerhoff, 1987; Carnevale, 1990; Jackson, 1989; Phillips, 1994). Linking training with results – for example, improved productivity, quality and service – is critical for justifying to management the cost of training and for maintaining the training function, especially during lean times when accountability for expenditure on training is a high priority.

Decisions about whether or not to provide training for employees, and what type of training should be provided, have typically been based on the determination of training needs within an organisation. For over 30 years, however, training theorists and researchers have bemoaned the reliance by organisations on ad hoc training decisions and the lack of application of more systematic approaches to training needs analysis (TNA). Even in recent times, surveys of how TNA is actually conducted illustrate that ad hoc processes are still the norm (Holden, 1991; O’Driscoll and Taylor, 1992; Saari et al, 1988), and there continues to be a gap between recommendations from researchers and what is actually practised. Latham (1988) has suggested that this gap is due to theory and research failing to filter through to practitioners. In addition to this, in this article we argue that bridging the research-practice gap could be facilitated by improving the existing conceptual framework which guides training needs analysis and training decisions.

Most treatments of training design and implementation refer to three interdependent phases – needs analysis, delivery and evaluation. Needs analysis is the most crucial time for establishing links between training and results because initial decisions are made concerning what training will be provided in organisations. TNA includes the establishment of training objectives, and influences how training will be developed, delivered and evaluated (Goldstein, 1993). Despite the importance of TNA to the entire training process, there has been little theoretical development (Goldstein, 1991; Moore and Dutton, 1978; Ostroff and Ford, 1989), particularly in terms of linking training initiatives to organisationally-valued results.

We propose a conceptual model which combines training with results in the needs analysis phase of training design by integrating critical aspects of two traditional TNA frameworks. After reviewing existing TNA theory, we describe our model and use it to organise a focused review of the training literature particularly relevant to TNA. We then distinguish two different focuses of training: results-focused training, which is aimed at enhancing organisationally-valued outcomes by improving how employees perform existing tasks; and task-focused training, used for preparing employees to perform tasks or jobs which are new to them. We specify the inferences that must be made in the needs analysis phase for each of these two different training aims, as well as how training objectives and evaluation strategies differ. Finally, we suggest alternative information-gathering strategies for both results and task-focused TNA.
Two theoretical models of TNA have dominated the training literature for over three decades: the organisation-task-person analysis framework (referred to as the ‘O-T-P’ model in this article) and the performance analysis approach. The former has dominated the academic literature, while the latter has been more popular among practitioners.

**O-T-P model**

In their seminal book, *Training in Business and Industry*, McGehee and Thayer (1961) introduced a framework for TNA by organising it into a system of three analyses: organisation analysis, task analysis (sometimes referred to as ‘operations analysis’), and man analysis (now referred to as ‘person analysis’). According to this framework, organisation analysis examines the organisation’s objectives and goals, resource needs and efficiency indices in order to determine where training is needed. Task analysis requires establishing performance standards, what tasks must be performed for standards to be achieved, how tasks are performed and the requisite knowledge and skills necessary to perform those tasks, in order to determine the content of training. Finally, through person analysis the training practitioner identifies who in the organisation should receive the training. This is accomplished by establishing the level at which each employee is performing in relation to performance standards, usually through performance appraisals or proficiency tests. Specific needs analysis techniques and information sources for each of these three major analyses were identified by McGehee and Thayer.

This typology has remained relatively unchanged over the past 30 years, and reviews of TNA in the academic literature and training textbooks (cf Goldstein, 1993; Tannenbaum and Yukl, 1992; Wexley and Latham, 1991) have continued to discuss needs analysis in terms of this framework.

Some noteworthy elaborations of the O-T-P model have been advanced in recent years. Moore and Dutton (1978), for example, conducted a thorough review of TNA techniques and sources of information reported in the literature, categorising them within the O-T-P framework. Goldstein (1991, 1993) and Goldstein and Gessner (1988) expanded organisation analysis by incorporating a consideration of the extent to which training goals match or are in conflict with the goals of relevant groups in the organisation. They also recommended including an assessment of the organisational climate for training. Hall (1986) and Goldstein and Gessner (1988) have recommended that training needs, in organisation analysis, must also be based on the future requirements of an organisation’s personnel to meet strategic objectives, and not just present job requirements as implied by McGehee and Thayer (1961).

Latham (1988) has noted that, when determining training needs based on future strategic objectives, minimising employees’ future technical obsolescence has become an ethical responsibility for organisations. He also added another component, which he called ‘demographic analysis,’ in response to some studies which indicated that differences seem to exist in the need for training across groups of employees of different ages, management levels, gender and races. While Latham proposed that this should be considered a fourth analysis, it might more logically be viewed as an extension of organisational analysis. Finally, Ostroff and Ford (1989) argued that TNA has focused on individual training needs and that the O-T-P framework should be expanded to include multiple levels of analysis.

While these elaborations have been important, the O-T-P approach remains a typology of TNA techniques and sources of information, with considerable overlap across the three categories of analysis (Moore and Dutton, 1978), and provides little guidance to practitioners.
on how to choose from the myriad TNA methods and sources of information. Furthermore, many TNA techniques associated with the O-T-P framework (e.g., TNA surveys and critical incidents) provide incomplete links between training and improved organisational functioning (Rummler, 1987).

**Performance analysis model**

Performance analysis is an alternative TNA model which focuses on identifying and determining the causes of discrepancies between expected and actual performance (Mager and Pipe, 1984; Rummler, 1987; Rummler and Brache, 1990) or between exemplary and average performers (Gilbert, 1978). A basic tenet is that a training need exists only when a performance discrepancy is attributed to a lack of knowledge or skills, and not to other potent influences on work behaviour, such as rewards and punishments which fail to support desired performance, inadequate feedback or resources, obstacles to performance or unclear performance expectations. Advocates of performance analysis claim that, more often than not, solutions to performance problems require changes in the work environment rather than increasing employees’ knowledge and skills, and that consequently much training conducted in organisations has little effect on work behaviour.

While performance analysis links training needs more explicitly with desired work behaviour than the O-T-P model, it still suffers from other limitations. Like the O-T-P model, training is only indicated through performance analysis when a performance discrepancy exists. This focus excludes training opportunities for continuously improving performance beyond expected levels or that of exemplar individuals or groups. Secondly, the model assumes that causes of performance discrepancies are either lack of knowledge/skills or work environment variables, but not both, which is often the case. Thirdly, it fails to distinguish between job behaviour and the organisationally-relevant results of job behaviour. This limited conceptualisation of the performance domain (Binning and Barrett, 1989) underemphasises the importance of determining which behaviour is critical for achieving organisational results and the need to account for external influences on these results. Fourthly, and most importantly, the performance analysis model has failed to specify how information can be collected for analysing the causes of performance problems and determining whether training is needed. Performance analysis requires judgements about performance discrepancies and their causes, but provides little guidance on how those judgments should be made and who should make them.

**INTEGRATIVE MODEL**

To address these limitations, we propose an integrative model which organises the myriad decisions and judgments facing both training practitioners and researchers when conducting TNA and designing training systems. This model, depicted in Figure 1 (*overleaf*), integrates the O-T-P and performance analysis models, as well as training needs analysis, with training objectives and evaluation. It illustrates how the specific linkages between training and results are mediated by knowledge/skills and job behaviour, as well as the competing influences on each endogenous variable. The directional arrows within the model indicate generally accepted causal relationships between components, moving from left to right. The analysis of linkages in performing TNA moves from right to left, as numbered.

Starting from the far right, the framework requires the identification of results of behaviour which are critical to organisational effectiveness. We use the term ‘results’ here to mean the same as Kirkpatrick’s (1977) Level IV criteria in training evaluation, and similar to
Binning and Barrett’s (1989) ‘outcomes’, Rummler’s (1987) ‘outputs’, Gilbert’s (1978) ‘accomplishments’, and what Campbell and his associates have termed ‘effectiveness’ (Campbell, 1988, 1990; Campbell and Campbell, 1988; Campbell et al., 1970). Many organisationally-valued results relate to financial aspects of unit and firm performance (eg sales volume and efficiency measures), but there are obviously others, such as employees’ satisfaction with supervision (which can be considered an outcome of supervisory behaviour), organisational climate and safety. Finally, there are often multiple organisationally-valued results, at various levels of proximity to specific employee behaviour, as depicted in the far right-hand side of Figure 1. For example, the immediate result of friendlier service by retail clerks may be satisfied customers, with more distal results including increased repeat business from customers, greater sales volume and ultimately improved performance on the part of the firm.

The remaining variables of the model are described below, within the context of the conditions necessary for training to have an impact on organisationally-relevant results. In brief, the extent to which a training initiative is likely to influence organisationally-valued results is a function of the strength of the three links between training and results (links 1, 3 and 5, represented by solid arrows). Given that, like job analysis, training needs analysis relies heavily on judgments made by training analysts and subject matter experts, estimates of the probable strength of each link between training and results can be assisted through the consideration of the competing influences on each endogenous variable (links 2, 4 and 6, represented by broken arrows).

**Conditions**

In order to identify training needs/opportunities which are likely to affect results, training analysts must confirm that three necessary conditions exist:

1. **Changing particular job behaviour of individuals is likely to improve an organisationally-valued result** For training to have an impact on a valued result, the result must be, substantially, a function of individuals’ job behaviour (link 1) as opposed to external influences (link 2). Link 1 has often been operationalised in the form of job and task analysis (Harvey, 1991). Job behaviour is organised around tasks which at higher levels combine to form jobs. External influences on results refer to factors outside the control of individuals for whom training is being considered, such as market conditions in a sales position.
These external influences on results have been discussed by Borman (1991), Campbell (1988), Campbell et al (1970), Mintzberg (1989) and Peters and O’Connor (1980), among others. For example, material costs in a manufacturing firm are likely to be critical to its success, and therefore identified as a result worthy of training needs analysis. However, analysis may suggest that this result is much more a function of external factors than of individuals’ behaviour, and so further training is unlikely to improve the result. Conversely, sales revenue generated by the marketing division might be substantially a function of the behaviour of individual sales representatives (along with competition, product demand and markets), hence further TNA would be warranted for this particular result.

Note that external influences on results are not limited to conditions outside the organisation but are any factors outside the control of the individual, including factors within the organisation. An employee’s ability to achieve a particular result could be primarily a function of the behaviour of members of other work units from within the same organisation. For example, improvements in the timeliness of headquarters’ staff in processing reports may be primarily a function of how quickly field staff submit necessary information. The existence of such factors might suggest that, in this case, individual training would have little impact on the particular outcome.

2. Changing particular knowledgeskills of individuals is likely to increase desired on-the-job behaviour In order for training to change relevant job behaviour, it must largely be a function of whether individuals possess the requisite knowledge/skills (Link 3) as opposed to other influences on behaviour (link 4).

Other influences on job behaviour refer to influential factors in employees’ work environments, such as contingencies on performance, feedback, resources, extent of task interference and clarity of performance expectations, as identified by performance analysts (e.g. Mager and Pipe, 1984). Such factors have also been described by Goldstein (1991) as situational cues and consequences, and by Waldman and Spangler (1989) as motivational components of performance.

3. Training is a viable means of improving critical knowledgeskills Non-training interventions to improve the knowledge/skill levels of employees (link 6) include improving employee selection/promotion strategies to acquire employees who already possess the requisite knowledge/skills, as well as on-the-job learning experiences and informal learning processes, such as observation of other employees or reading relevant educational material. For example, a health maintenance organisation may have identified that patients’ satisfaction with services (organisationally-valued result) is partially a function of its physicians’ interpersonal behaviour with patients, and that this behaviour is largely a function of physicians’ interpersonal skills. However, suppose that further analysis reveals that those physicians most lacking in interpersonal skills are those close to retirement, and that good interpersonal skills have been emphasised recently through its physician recruitment and selection procedures. In such a case, the organisation may decide that improving its physicians’ interpersonal skills could be achieved more effectively through continued emphasis on selecting applicants with the requisite skills, rather than through training of existing staff.

In sum, the proposed model highlights that improvements in knowledge/skills, desired behaviour and results can be achieved by combining training with other interventions in order to realise greater gains than can be achieved by training alone. Training transfer strategies, for example, are a means of influencing job behaviour other than by improving individuals’ knowledge/skills (link 4). Training transfer research has demonstrated that,
when used in combination with training, strategies such as feedback (Komaki et al, 1980), management support (Huczynski and Lewis, 1980; Taylor, 1992), self-management (Gist et al, 1991), relapse prevention (Tziner et al, 1991) and providing opportunities to apply newly-learned skills (Ford et al, 1992), can increase the use of these skills beyond what can be achieved by training alone. Similarly, several writers have suggested that training should be implemented as part of larger organisation development interventions (Jamieson, 1981; Lippitt, 1982; Moore and Dutton, 1978; Roback, 1989). Many organisation development interventions can address the changes needed in the work environment to support desired behavioural changes eg changing job characteristics and design. Additionally, changes in performance consequences, such as pay, may also be required.

**Levels of analysis**

As previous writers have suggested (Moore and Dutton, 1978; Ostroff and Ford, 1989), training needs can be viewed from multiple levels of analysis. The present model can be used for determining training needs at various levels of analysis, including:

- **Individual level** eg through discussions between individuals and managers or HR specialists;
- **Group/organisational level**, in which the analysis is focused on a particular job or family of jobs across a work group or organisation; and
- **Inter-organisational level**, in which generalisable training needs for a particular job/job family are linked to results shared by many organisations, eg customer service training for customer contact employees.

The same inferential links need to be established to identify training which will influence results, regardless of the level of analysis.

**TNA for continuous improvement**

The identification of a training need does not necessarily depend on there being gaps between expected and actual levels of results, as is implied by both the O-T-P and performance analysis approaches to TNA. Results may be improved beyond, or even in the absence of, expectations.

For example, training efforts in a manufacturing firm might be applied toward continuously minimising production costs, improving quality and decreasing lost-time accidents. As long as improvements in these areas are valued by the organisation, setting objectives or standards for these areas and then assessing the gap between present and desired performance are superfluous steps in the TNA process. Furthermore, these steps are inconsistent with the current emphasis on continuous improvement in many organisations. In this way, a results-focused analysis may be viewed more accurately as identifying training opportunities, and not simply determining ‘needs’ in the sense of deficiencies. Later in this article we discuss how results-oriented training opportunities can be identified and prioritised.

**Integration of TNA and training evaluation**

The critical linkages between training and organisationally-valued results of the present model mirror the criteria presented in the predominant training evaluation model developed by Kirkpatrick (1977), namely that change in knowledge/skills (learning), on-the-job behaviour and organisationally-valued results are all viewed as consequences of training. In addition to these three training outcomes, Kirkpatrick’s evaluation model includes a fourth training criterion, trainee reactions. We have not included reactions in our TNA model because we do not view changes in learning or job behaviour as necessarily mediated by trainees’
attitudes toward training i.e., their reactions to the training. Evidence provided by Alliger and his colleagues (Alliger and Janak, 1989; Alliger et al., 1997) supports this conclusion.

The similarity between TNA and evaluation criteria should not be surprising, considering that the purpose of both is to inform training decision makers about implied linkages between training and relevant outcomes. The main differences between the two are that, like job analysis, TNA relies heavily on expert judgements – e.g., training analysts and subject matter experts – to assess likely linkages, while training evaluation relies on empirical evidence and is used to confirm linkages.

While training evaluation has traditionally been viewed as distinct from TNA and considered only at the end of the training cycle, we argue that its fundamental purpose is to provide input into decision making at the beginning of the training cycle, just as TNA does. As the number of published training evaluation studies increases, evidence for the linkages between training and outcomes can rely not only on expert judgements, but also on empirical evidence provided prior to training evaluation. For example, an organisation which is considering whether behaviour modelling supervisory training is likely to lead to improved work-group performance might rely heavily on prior evaluation studies conducted in other, similar organisations, which include empirical assessments of the training’s effect on learning, behaviour change and results. Thus both TNA judgements and empirical evidence from prior training evaluations can be used to assess the likely linkages between training and desired outcomes. We discuss the use of such evidence later.

Finally, similarities and differences between our model and models of training transfer should be noted. Much research and theoretical attention in recent years has been given to ways of increasing training’s effect on changes in on-the-job behaviour (referred to as ‘training transfer’). A number of theoretical models explaining the antecedents to training transfer have been proposed and tested recently (e.g., Baldwin and Ford, 1988; Goldstein, 1991; Noe, 1986; Rouillier and Goldstein, 1991), which are generally consistent with the present model, for instance, in suggesting that the relationship between training and changed job behaviour is mediated by learning, and that variables in the work environment have independent influences on job behaviour.

The present model, however, also includes an analysis of the consequences of transfer i.e., the link between changed job behaviour and organisationally-valued results. In the interest of parsimony, we have omitted antecedents to transfer which other transfer models have included but which are not critical for TNA, such as the moderating influence of trainee and situational characteristics on learning and transfer, for example trainees’ self-efficacy.

**Results-focused TNA**

Much of the training provided in organisations is aimed at achieving organisationally-valued results by improving how employees perform their present jobs, as observed by Meigs-Burkhard (1986) in a survey of training professionals. For example, existing managers are often given management training in the hope of improving unit productivity and morale; customer contact staff are trained in customer service skills to enhance the organisation’s reputation and to increase repeat business with customers; safety training is provided to reduce the number and seriousness of accidents. In all these cases a results-focused approach to TNA is necessary to maximise the likelihood that training achieves its objectives. The present framework offers a basis for such analysis.

Consider an organisation which manufactures and sells large computer systems. A key result area is profitability, one aspect of which is minimising the price discount negotiated with customers by the company’s sales executives. After identifying ‘minimising price
discounts’ as an organisationally-valued result, the training analyst must determine whether this is largely influenced by the negotiating behaviour of sales executives (link 1) or by other factors outside their control (link 2), such as retail price levels and the market.

Let us assume that, through an analysis of links 1 and 2, minimising negotiated price discounts with customers is determined to be largely a function of specific negotiation behaviour on the part of sales executives, such as responding to customers’ initial price objections through using probing questions or emphasising product value, rather than offering a price discount immediately. Next, the analyst must determine whether the negotiation behaviour of sales executives is primarily a function of their knowledge/skills (link 3) or other influences on behaviour (link 4).

If, for example, sales executives’ compensation consists solely of base salary plus commission tied to dollar sales volume, they are unlikely to negotiate for the highest possible sale price, regardless of their negotiation skills, because offering large discounts immediately is likely to close more sales. In this case, sales negotiation training may have little effect on sales executives’ subsequent negotiating behaviour because it is in their best interest to discount the sale price immediately.

If, on the other hand, sales executives’ compensation is partially based on saving the employer discount points – that is, negotiating high sale prices – or the compensation structure for sales executives is modified as a result of the training needs analysis, improving sales executives’ negotiation skills is likely to lead to better price negotiations with customers (link 3). Finally, the analyst must determine whether training is the most effective means of increasing sales executives’ negotiation knowledge/skills (link 1) as opposed to non-training alternatives (link 2).

Objectives
Training objectives can be stated in terms of improved knowledge/skills (learning), on-the-job behaviour or results. Most discussions of training objectives have focused on the development of learning and behavioural objectives, with preference for the latter. It is surprising that, while training is often meant to influence results, the specification of results-level criteria is not usually discussed or accomplished until the evaluation phase of training, when criterion variables are identified. Training is more likely to influence results when results-focused objectives are identified in the needs analysis phase and coupled to learning and behavioural objectives.

Using the sales negotiation training example provided earlier, the following are examples of integrated learning, behaviour and results objectives:

**Learning objective** ‘Sales executives will learn alternatives to granting price discounts in response to customers’ initial price objections’

**Behavioural objective** ‘After training, sales executives will respond to customers’ initial price objections through probing or emphasising product value more frequently, and offer initial price discounts less frequently’

**Results objective** ‘After training, the average negotiated sale prices of systems sold will be significantly greater’.

In practice, a training programme might have multiple results objectives, with each result objective coupled to multiple learning and behavioural objectives.

**Task-focused TNA**
Not all training initiatives are explicitly meant to affect results. Some organisational training is simply meant to prepare employees for performing tasks or jobs that are new to them. Examples of task-focused training include:
training new hires;
• teaching existing employees how to accomplish new tasks which are required by new technologies – eg computerisation or robotics – or new systems or procedures, such as statistical process control or a new performance management;
• developing employees for future positions within the organisation such as transfer or promotion; and
• (re)training employees for work in another organisation as a result of plans to reduce the present workforce.

In these cases, training is usually intended to bring individuals up to a particular level of performance. Successfully executed tasks are assumed to achieve particular results, but the focus of the training is on achieving a certain level of task performance, not the results per se.

With task-focused TNA the analysis is centred on the links between training, knowledge/skills and behaviour/task performance (links 3, 5 and 6), with less concern for the link between behaviour/tasks and results (link 1). An illustration of a task-focused approach to training can be found in Campbell (1988), who argued that the responsibility of training is only to have employees perform tasks or jobs satisfactorily, and that it is up to those who design tasks and jobs to ensure that tasks are relevant to organisational goals. Similarly, when organisations introduce new equipment, systems or procedures, increases in productivity or other valued outcomes are usually expected, but these improvements are viewed as the responsibility of the new equipment, system or procedure, not the training itself. Training is simply one necessary component of implementing the new task. Thus TNA in these cases focuses on the true sense of a ‘training need’; that is, on the training individuals will need in order to successfully perform tasks which are new to them.

Training which teaches employees tasks/jobs which are new to them is typically concerned with bringing individuals up to a particular level of knowledge/skills, and thus a level of job behaviour/task performance, rather than a change in each, as is common when training present employees for improved results. Boyatzis (1982: 23) has referred to such requisite levels of knowledge/skills as ‘threshold competencies,’ which he has considered ‘essential to performing a job [or task], but not causally related to superior job performance’.

The emphasis in task-focused TNA on identifying threshold competencies necessary for achieving a level of task performance has implications for training objectives and therefore training evaluation. While results-focused training objectives are typically stated in terms of change in knowledge/skills, job behaviour and results, task-focused training calls for objectives which are stated in terms of the attainment of particular levels of knowledge/skills and job behaviour, ie task performance.

Consider the example of an organisation which introduces a new computerised management information system in order to provide managers with more current and accurate performance data for their divisions. One of several groups of staff requiring training in the new system is the managers themselves, and examples of possible training objectives for the managers include the following:

Knowledge/skill objective ‘Trainees will be able to demonstrate their understanding of the account code structure of the new system as well as its query language’

Behavioural (task performance) objective ‘Trainees will be able to make enquiries on the system about the current financial performance of their divisions’.

Note that, in comparing these objectives with those listed earlier in reference to results-focused training, these are stated in terms of levels of performance, rather than change. Thus, in the case of task-focused training, ‘learning’ objectives are more appropriately
referred to as knowledge/skill objectives because the focus is not really on improvement in individuals’ knowledge or skills, as implied by the term ‘learning’.

Task-focused training decisions can be made at the individual, group, organisational and inter-organisational levels of analysis, as is the case in making results-focused training decisions. For example, new tasks or jobs which are likely to be faced by an individual or group can be analysed to determine training needs for those future roles. At an inter-organisational level, the developer of a new product or system, e.g. new machinery or software, can identify the likely training needs for most individuals learning the new product or system, by determining the knowledge/skills required for successful performance and comparing them with an estimate of the level of knowledge/skills of those who will use the new product or system.

In sum, task-focused training should simply be considered a special case of results-focused training. Ultimately, task-focused training activities should also lead to organisationally-relevant results. The essential difference is that, with task-focused training, the responsibility for achieving results has been placed on something other than the training itself (e.g. the definition of the task/job and the new system). Other important distinctions between task and results-focused training for making training decisions concern which links of the model are emphasised, the nature of training objectives and, as will be discussed shortly, training evaluation strategy, data collection strategies and the application of training utility analysis.

Results versus task-focused training

The evaluation of task-focused training differs from results-focused training in two ways. First, since the goal of training is to bring trainees up to a particular level of task proficiency, the evaluation strategy need not include a results criterion (level-IV evaluation in Kirkpatrick’s framework). Even an evaluation of on-the-job behaviour (level-III evaluation) may not be appropriate in cases in which task-focused training objectives are to bring trainees to a point of being able to perform particular tasks. In these cases, training evaluation may rely on assessing skills (level II evaluation) through a task simulation, with an interest in assessing individuals’ maximum performance, rather than their typical performance while executing these tasks on the job (Sackett et al., 1988).

The second way that the evaluation of task-focused training differs is in evaluation design. In cases in which training objectives are stated in terms of the achievement of particular levels of performance, an evaluation design which simply measures whether trainees have reached desired levels of performance is appropriate, rather than traditional change-due-to-training evaluation strategies, such as pre-test/post-test, control group and time-series evaluation designs. This point has been aptly made by Sackett and Mullen (1993), who used the example of training assessment centre assessors in order to reach a particular level of inter-assessor reliability. An appropriate training design in this case would be one that simply determines the level of inter-assessor reliability, not a design which establishes whether assessors are significantly more reliable than they were before training. Similarly, in the example used earlier of training managers in a new computerised management information system, the appropriate evaluation design determines whether trainees have acquired the necessary level of knowledge/skills to perform system queries, not whether they have significantly more knowledge, skills or attitudes in these areas than before training.

In summary, we have distinguished two fundamental aims of training – results and task focused – the former requiring a larger set of inferential links than the latter when making training
decisions. An overview of how training for these two different purposes differs in terms of TNA strategy, training objectives and training evaluation is presented in Table 1 (overleaf).

From a broad perspective, identifying training needs at any level within the organisation involves an assessment of both task-focused training needs and results-focused training opportunities, each requiring different types of information for making training decisions. At the group and organisational levels, those responsible must identify training needs of individuals who will be performing new tasks and jobs, but they can also assess training opportunities which could lead to improved results for the organisation. Similarly, at an individual level, individuals and their manager or training analyst can identify both training needs based on new tasks/jobs to be performed as well as training opportunities which may improve results at the individual level.

GATHERING DATA FOR TRAINING DECISIONS

A variety of TNA methods and sources of information have been suggested in the training literature, such as conducting TNA surveys and interviews with employees or their managers, observing employees, responding to managers’ requests and using performance appraisals. In their review of the TNA literature, Moore and Dutton (1978) listed as many as 34 different techniques and sources of information, and subsequent reviews of TNA methods have included still others (Newstrom and Lilyquist, 1979; Rummler, 1987; Zemke and Kramlinger, 1982; Goldstein, 1991).

Those responsible for making training decisions have typically been advised to use multiple TNA techniques (Campbell, 1988; Goldstein, 1991; Steadham, 1980; Zemke and Kramlinger, 1982), but little guidance has been provided for choosing from the many alternatives that exist (Goldstein, 1980; Goldstein and Gessner, 1988; Wexley, 1984). By considering task and results-focused training needs separately, and the necessary links between training and desired results in the case of the latter, developing a TNA strategy from the various alternative methods and information sources becomes clearer because required information has been identified, leaving only choices about sources for that information, eg surveys and observation; and how information is collected, eg individual or group interviews and questionnaires. Next we explore what information is necessary for making task-focused versus results-focused training decisions and suggest TNA methods for each. As TNA for task-focused training is the simpler of the two, we address this first.

Task-focused training decisions

Task-focused TNA must start with the identification of tasks/jobs which will be new to individuals, such as new systems, procedures or technology, new hires and anticipated new job assignments (eg promotions). At the organisational level, sources include reviewing written documents, eg strategic and business plans, discussions with managers, and other personnel planning systems such as personnel inventories and succession plans. At the individual level, new tasks/jobs might be identified through discussions between the individual and their manager, eg at a performance planning/appraisal meeting, by the individual alone or with coaching from a training specialist.

Once tasks/jobs which will be new to individuals have been identified, so must the knowledge/skills required to perform them, eg through a traditional task or job analysis in which the task/job is broken down into component behaviours leading to knowledge/skills required for each (link 3 in Figure 1). Various task/job analysis approaches have been
TABLE 1 Comparison of TNA strategy, objectives and evaluation strategy for task-focused and results-focused training

**Task-focused training**

**Purpose** Preparing employees to perform tasks/jobs which are new to them, such as:

- a) training new hires;
- b) when new systems, procedures or technology have been introduced;
- c) preparing individuals for promotion or other new job assignments;
- d) when (re)training employees who will soon be laid off in preparation for new jobs outside the organisation.

**TNA strategy** Knowledge/skill requirements for performing task/job successfully are identified through a task/job analysis. Level of employees’ knowledge/skills within these requirements is identified through either surveys, tests, simulations, work samples, observations or performance appraisals.

Where gaps exist between knowledge/skills required and possessed by employees, training is needed.

**Objectives** Stated in terms of levels of knowledge/skills and behaviour/task performance to be achieved by trainees.

**Evaluation strategy** Evaluation criteria are knowledge/skills and behaviour/task performance. Evaluation strategy simply measures whether trainees have reached the levels of knowledge/skills and behaviour/task performance. A ‘no training’ evaluation condition is unnecessary.

**Results-focused training**

**Purpose** Achieving organisationally-valued results by training employees to perform their present tasks/jobs more effectively.

**TNA strategy** Organisationally-relevant results are identified for particular jobs/job families, followed by an analysis of:

- a) behavioural and external influences on those results;
- b) extent to which desired job behaviour is a function of knowledge/skills versus other influences; and
- c) whether training is the most effective alternative for increasing employees’ knowledge/skills.

Linkages between training and results can be established judgmentally or empirically (or both). Focus is on knowledge/skills and job behaviour linked with results which are not demonstrated in most existing employees.

Multiple results-focus training opportunities can be prioritised and compared with non-training interventions to improve results through estimations of the size and utility of training effects on results.

An analysis of the level of knowledge/skills among incumbents is usually unnecessary with results-focused training, as only results-related knowledge/skills and job behaviour beyond those demonstrated by most employees have been identified.

**Objectives** Stated in terms of change, and include linked learning, job behaviour and results objectives.

**Evaluation strategy** Evaluation criteria include learning, job behaviour and results. Evaluation strategy must measure change in training criteria, and therefore focuses on a comparison between ‘training’ and ‘no training’ conditions (eg pre-test/post-test, control group designs or time series designs).
developed for such purposes, including interviews with incumbents and managers, observations of the job and performing the job oneself (see Goldstein, 1993 for a review).

In task-focused training situations an assessment of potential influences on job behaviour other than individuals’ knowledge/skills (link 4) is possible, but often irrelevant because the purpose of training is only to bring trainees’ knowledge/skills to a level in which they are able to perform tasks/jobs. Work environment influences on whether incumbents employ appropriate task behaviour are often viewed as the responsibility of those who have designed the task or job, not of training *per se*.

In cases where individuals are likely to possess some of the knowledge/skills required for successful task performance prior to training, an evaluation of their present level of those knowledge/skills is necessary and can be achieved through a survey (*eg* of incumbents), judgements by others (such as through performance appraisal ratings), tests and simulations, work samples and observations.

Once gaps have been identified between the knowledge/skill requirements for a task/job and the level of knowledge/skills of the individuals involved, the final decision concerns whether training or a non-training alternative would be a viable means of narrowing that gap, although in most cases the decision to train target employees is a given.

**Results-focused training decisions**

Identifying training that is likely to influence organisationally-valued results is more challenging than task-focused TNA in two respects:

- it involves the analysis of additional inferential links (namely links 1, 2 and 4 in Figure 1);
- it requires the identification of salient job behaviour which is not presently employed by existing staff, as well as knowledge/skills not consistently possessed by those staff.

Consequently, the traditional task analysis approach to TNA, which breaks tasks down to specific behaviour and knowledge/skill requirements, is a weak method to use for results-focused training because it fails to focus on end results and it is usually not sensitive enough to identify the subtle behaviour and knowledge/skills that would lead to incremental improvements in the achievement of valued results among employees who are already performing the job adequately. Typical needs analysis surveys ask respondents to rate a list of global knowledge/skill areas (*ie* competencies and dimensions) in terms of their training needs (Ford and Noe, 1987; Oppenheimer, 1982), or ask individuals to rate both the importance of particular tasks or knowledge/skills and their proficiency in each (McEnery and McEnery, 1987; Nowack, 1991). Given that, in some surveys, training needs for present jobs versus future jobs are not distinguished, and that none of these surveys ask respondents to focus on specific, organisationally-valued results, it is not surprising that studies involving the use of such surveys have resulted in discrepancies between the training needs perceived by employees and their supervisors (McEnery and McEnery, 1987; Yammarino and Waldman, 1993), thus calling into question the validity of their findings. Finally, the global nature of the knowledge/skills listed on TNA surveys give them a very limited ability to identify the specific knowledge/skills which would lead to incremental increases in performance and results.

As shown in Figure 1, in order for training opportunities which are likely to improve the achievement of results to be identified, the analysis must start with the identification of organisationally-valued results, followed by an analysis of behavioural and external influences on results, influences on behaviour and training versus non-training alternatives for improving knowledge/skills.
Identifying organisationally-valued results

Many sources of information have been suggested in the TNA literature, under the heading of ‘organisational analysis’ in the O-T-P framework, which can be used for identifying results. At the organisational level of analysis, these include identifying organisational goals and objectives and reviewing climate, productivity and efficiency indices (see Moore and Dutton, 1978, for a more complete list). Results can be identified through interviews with key managers in the organisation, or by reviewing the organisation’s strategic, operations and business plans. At the individual level of analysis, results can be identified through key result areas and performance goals included within job descriptions and performance management systems. Once valued results have been identified, information must be gathered to identify relevant job behaviour, knowledge/skills and training opportunities for jobs which affect those results.

In most cases, quite a few organisationally-valued results will have been identified and, given limited training budgets, prioritisation will be necessary. However, decisions concerning the priorities of training opportunities should be a function both of how important the result is to the organisation or unit and the likely impact that training will have on improving that result. Thus, while training analysts may wish to perform a tentative prioritisation of organisationally-valued results after they have been identified, final training decisions should also take into account the likely impact that training would have, by assessing the strength of the training-results linkages, as described below.

Linkages between training and results

Types of information which can be used to link training to results can be grouped into two broad categories: judgments of subject matter experts (SMEs) and empirical evidence derived through correlational and experimental studies.

SME judgments  Virtually all TNA methods involve gathering such judgments. These include discussions with senior managers (often referred to as ‘key consultations’), individual and group interviews with incumbents or their supervisors, TNA questionnaires and the identification of training needs through performance appraisal discussions between individuals and their supervisors. While the validity of training needs identified through these methods is influenced by many factors, such as who is consulted and how systematically data are collected and analysed, our focus here is on what judgements SMEs are asked to make. In order for a training opportunity to be identified which is likely to affect results, SME judgements concerning all links presented in Figure 1 must be addressed.

Consider first an application of Figure 1 to SME judgements made at an individual level of analysis, through TNA discussions between individuals and their managers in the context of a performance appraisal. The framework in Figure 1 can be used to structure a series of judgements to be made by individuals and their managers concerning training opportunities for individuals to improve results in their present jobs. Training needs to prepare the individual for new tasks/jobs might also be discussed in these performance appraisal meetings, following the format discussed earlier in relation to task-focused training decisions. Individual-level results are likely to have been identified through the performance planning process. Employees and their managers might first be asked to focus on critical results which are largely a function of individual behaviour. These might include results which individuals have failed to achieve fully in the past, but may also include any results for which improvement would benefit the organisation and which are influenced by individuals’ job behaviour. Next individuals and their managers might clarify:
particular behaviour which is critical to achieving improved results (link 1);

the extent to which such behaviour is a function of possessing particular knowledge/skills (link 3) versus other influences on individuals’ behaviour (link 4); and

whether training is likely to be the most effective means of improving individuals’ knowledge/skills (links 5 or 6), assuming that behaviour is judged to be largely a function of knowledge/skills.

Figure 1 can also be used as a framework for a results-focused TNA survey/interview strategy at the group and organisational levels of analysis involving multiple groups of subject matter experts. Senior managers might be consulted to identify organisationally-valued results, along with jobs within the organisation which have the greatest influence on those results. Once results have been established, interviews or questionnaires might be administered to incumbents, their supervisors and others familiar with the job/job family to identify specific behaviour which is likely to influence those outcomes. The critical incident technique can be particularly valuable in identifying such behaviour-results links, provided that respondents are asked to focus on results which have been targeted by the organisation. Once critical behaviours are identified, respondents can be asked to estimate the extent that results are a function of such behaviour (Link 1), as opposed to external influences (Link 2). Respondents might subsequently be asked to judge the extent to which target behaviour is a function of knowledge/skills (Link 3) versus other influences on such behaviour (Link 4). Finally, training specialists might determine whether training or non-training alternatives would be the most effective means of increasing required knowledge/skills (Links 5 and 6).

Empirical evidence Although judgmental approaches are necessary to determine which behaviours, knowledge/skills and training are likely to affect results, evidence of the strength of those linkages can be found through correlational and experimental studies. Furthermore, greater confidence can be placed in a decision to implement a results-focused training programme if the training has been linked with valued result through both SME judgements and empirical evidence.

Correlational research to date in TNA has focused on the critical relationship between particular job behaviour and results (link 1). In the typical correlational study a set of specific job behaviours, hypothesised to relate to desired results – usually based on judgements made by SMEs – becomes the basis of a behavioural checklist. Through a structured observation process, trained observers record the frequency with which each type of behaviour is used and incumbents are independently scored or grouped on criterion variables which represent the organisationally-valued results. The strength of relationships between the frequency of job behaviour and results can then be measured, with salient job behaviour forming the basis of training.

Examples of this type of correlational approach are: Rackham and Morgan’s (1977) analysis of differences in the behaviour of managers who conduct performance appraisal sessions at average and superior levels of performance on relevant outcomes; Korsch and colleagues’ identification of patient relations behaviour that distinguishes physicians who have more satisfied patients (Korsch et al, 1968; Korsch and Negrete, 1972); and studies reported by Zemke and Kramlinger (1982) linking particular job behaviour with valued results among casino dealers, sales people and customer service personnel.

The structured observation required in such studies makes them labour intensive but, because they can help identify specific, individual behaviours which are linked to desired results and employed by only some individuals in any group, they are particularly useful in
identifying training opportunities to improve results through the training of employees in their existing jobs. Using this approach to identify job behaviour linked with results is most likely to uncover salient behaviour in tasks/jobs which have little structure, referred to as ‘weak situations’ by Herriot (1981), for there is likely to be considerable variance across employees in both the ways the task/job is performed and in the results individuals achieve. This variation in both job behaviour and results is necessary in order to find sizeable correlations between the two.

Experimental training evaluations that include as dependent variables learning, job behaviour and results can also provide evidence of links between training and these outcomes. Beyond confirming a relationship between job behaviour and results (as provided by the correlational approach described above), experimental evaluations indicate whether providing the training is causally linked to desired outcomes. Even though summative evaluation occurs at the end of the training process, the information it yields is most useful for linking training to outcomes when making decisions about whether to implement, or continue implementing, a particular training programme.

There have been surprisingly few correlational and experimental studies linking trained knowledge/skills and specific job behaviour with results. The focus of most published training evaluations, as well as meta-analytic reviews of those studies (eg Burke and Day, 1986; Falcone, 1986; Guzzo et al, 1985), has been the effectiveness of the training methods employed, not the specific training content – that is, the knowledge/skills and behaviour taught. However, as both Gagne (1962) and Campbell (1988) have argued, careful identification of training content is far more important than choice of instructional method, even though the latter has more glamour. For example, members of the training profession are likely to be more interested in reading about the validity of a training programme which employs state-of-the-art simulations using virtual reality, rather than the validity of the particular knowledge/skills taught in the programme in terms of changing job behaviour and results. Additional research is needed which specifies trainable knowledge/skills which can influence results for various job families, particularly findings which are generalisable across organisational settings.

In sum, both judgmental and empirical evidence can be gathered to establish links between training and results and, in the case of judgmental evidence, SMEs can include various individuals who are able to define organisationally-valued results and provide job-related information. Greatest confidence in results-focused training decisions stems from obtaining judgmental evidence from multiple SMEs as well as empirical evidence for linkages.

In contrast to task-focused training, results-focused training is unlikely to require the determination of employees’ level of knowledge/skills – eg through surveys, tests and simulations – in order to determine who should attend training. Since results-focused TNA identifies knowledge/skills and behaviour not demonstrated among most incumbents, the training is likely to be provided to all incumbents in the job or job family, and so a ‘person analysis’ to determine who should attend training may not be necessary.

**Utility analysis and training decisions**

A training department that devotes extensive effort to discerning organisationally-valued results and training opportunities to improve those results is likely to identify more than one, and with a limited training budget will have to prioritise these opportunities. Not only do experimental training evaluations confirm links between training and changes in knowledge/skills, behaviour and results; they also permit the estimation of the size of the training effect on job behaviour and results, from which the utility of the training prog-
ramme, in terms of monetary value, can often be estimated (Carnevale, 1990; Cascio, 1989). Using utility estimates, decision makers can consider the cost effectiveness of various results-focused training alternatives in relation to each other and to non-training expenditures which are also aimed at improving organisationally-valued results. However, such comparisons are more difficult when results of training cannot easily be quantified in financial terms, such as the value of safety training designed to reduce the number of lost-time accidents.

In the case of training employees to perform tasks/jobs which are new to them, training is essential, because not providing training simply means not having the task or job performed. Consequently, there is little sense in prioritising task-focused training needs and in calculating the size and utility of task-focused training effects. While it may be sensible for an organisation to estimate the impact on results of introducing a new system, procedure or job, such an estimate is not of training per se. For example, if we consider a manufacturing plant which installs new machinery expected to return $1 million a year due to increased production capacity, even though implementing the new machinery requires the training of existing employees in how to operate it, it would be folly to claim that the benefit of the training is estimated to be $1 million. Rather, the new equipment itself contributes to the increase in production capability.

**IMPLICATIONS FOR PRACTITIONERS**

In order for both task and results-focused training needs and opportunities to be established within an organisation, procedures to uncover each must be put in place. These can be established at the organisational, unit, work group or individual levels of analysis. For example, procedures can be established at the organisational level to identify task-focused training needs through the use of HR information systems which include succession plans and which track employees’ various knowledge/skills. Alternatively, responsibility for identifying task-focused training needs can be placed at lower levels of the organisation, such as at the individual level, by making the identification of training needs a component of the regular performance management process. Similarly, the responsibility for identifying results-focused training opportunities can be placed at various levels within the organisation. The optimal level of responsibility in an organisation is dependent on a number of factors, particularly the level of training analysis knowledge/skills among staff, eg knowledge of job requirements, available opportunities for promotion and organisational needs.

Clearly, conducting a results-focused TNA requires the analyst to look beyond what managers or individuals have stated as training needs. Following the model we have presented here, the analyst must confirm a series of links between the proposed training and desired results, including the identification of non-training influences on behaviour and results. Often, such an investigation will involve questioning the assumptions of managers and employees about the causes of performance problems, and may identify the need for non-training solutions. Such an investigation may be politically difficult for training analysts to conduct, particularly if the analyst is relatively new to the job and there has been a culture of the training department simply responding to managers’ and individual employees’ training requests. However, such investigations are essential for training to have an impact on organisationally valued results, and failure to do so at the early stage of making training decisions is likely to lead to the even worse outcome of training having little or no impact on employees’ performance and desired results.
CONCLUSIONS

The internal validity of the present framework is ultimately judged by the emergent pattern of empirical and rational support for the various inferential links between the various components. For example, validation of link 5 would result from systematic examination of how various training curricula and media enhance knowledge and skill acquisition. Link 6 may then be thought of as a class of variables which moderate training ‘effectiveness’. Experimental manipulation of training variables, combined with empirical evaluation of knowledge/skill acquisition and measurement of non-training moderators, would help establish the validity of links 5 and 6. Similarly, links 1, 2, 3 and 4 need to be examined empirically. Ultimately, structural equation models of various combinations of training and non-training influences on organisational functioning can help test the validity of all links simultaneously.

The external validity of the framework can be assessed by comparative research pitting traditional training needs analysis against that conducted by professionals whose analysis conforms to the structure presented here. Careful cost accounting of the two methods, as well as evaluation of the specific nature of training recommendations, could shed light on the validity and utility of the framework. This validation effort could also be modelled after the work by Levine et al (1983), who compared several job analysis systems against several practical criteria to determine their relative merits. This type of research could also be focused on whether groups versus individuals make better needs analysis decisions. It is interesting to hypothesise that better analyses of links 1 to 6 might result from a panel of subject matter experts drawn from the multiple constituencies (Tsui and Milkovich, 1987) in any given organisation, compared to a single training professional.

Links 2, 4 and 6 represent the areas in greatest need of research. One immediate need is the development of taxonomies of ‘external’ influences on organisational results, job behaviour and knowledge/skill components of the framework. This will require some integrative work to meld the micro conceptions of individual performance determinants with macro conceptions of situational factors affecting organisational results.

We have outlined a model for training decisions which incorporates salient features of the two most prominent extant approaches to training needs analysis, and which extends these approaches by integrating training decisions with organisationally valued outcomes or results. The framework described here builds a bridge between theory and practice in training needs analysis, by:

- specifying all the inferential links which need to be established in the needs analysis phase of training in order to identify training opportunities likely to enhance organisationally-valued results; and
- clarifying how different TNA strategies, types of training objectives and evaluation designs are required for task and results-focused training.

Finding training opportunities to improve organisationally valued results requires the confirmation of multiple inferences and data gathering beyond simple needs analysis surveys, critical incidents etc, which are commonly used in training practice. Ultimately, talk of the bottom line impact of training on organisational functioning and performance is little more than lip-service, unless training is linked with results at each stage in the training process.

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Notes

1 Some training scholars have included abilities (eg Goldstein, 1993) or attitudes (eg Kraiger et al, 1993) along with knowledge and skill as learning outcomes of training. We have chosen not to include abilities in the present model because they are generally viewed as unchangeable and thus more appropriate for personnel selection than training. Attitude change might be considered a legitimate learning level outcome of training. However, it is debatable whether attitude change is a necessary, or even a facilitative, antecedent for behaviour change, and so we have also omitted it from this model.

2 Given that the context of this article is training and not selection, we focus here exclusively on work environment variables which contribute to an individual’s motivation, and not inherent individual differences in motivation.

3 As originally presented (Flanagan, 1954), the critical incident method focused respondents on a particular result – near misses among aircraft pilots – when eliciting relevant behaviour, but many applications since have failed to focus on pre-determined results. Instead, they have simply asked for examples of effective and ineffective performance.

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