Planning, managing, and optimizing transfer of training

M. Anthony Machin

University of Southern Queensland

Published in 2002 in K. Kraiger (Ed.), *Creating, implementing, and managing effective training and development*, (pp. 263-301). San Francisco: Jossey-Bass.

Address for correspondence: Tony Machin, Dept of Psychology, University of Southern Queensland, Toowoomba. 4350. Australia. Email: machin@usq.edu.au

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Broad and Newstrom (1992) defined the transfer of training to the workplace as "the effective and continuing application, by trainees to their jobs, of the knowledge and skills gained in training - both on and off the job" (p. 6). Broad and Newstrom also stated that, in their experience with a wide range of organisations, transfer problems nearly always occurred when training employees. Other authors have suggested that as little as 10% of training is transferred to the workplace (Georgenson, 1982), although this level may be higher immediately after training, and decline over time (Newstrom, 1986). Whatever the actual level of transfer of training, when training does not transfer, it is likely that employees will perceive training to be a waste of their time and employers will continue to question the benefit of their investment in training. A number of authors have addressed the problem of how best to optimise the transfer of training. While the focus of this chapter is on specific strategies for improving transfer of training, there are several important theoretical models of the transfer process that form the foundation of these improvement strategies. Therefore, some of these models will be outlined, an integrated model will be described, and then the specific strategies for optimizing the transfer of training will be presented.

Broad and Newstrom (1992) outlined a series of strategies for managing the transfer of training that focused on three time periods (before, during, and after training) and on the responsibilities of three separate organisational roles (the role of the manager, the role of the trainer, and the role of the trainee). Milheim (1994) also presented a model for the transfer of training that included pre-training strategies, strategies for use during

training, and post-training strategies. The strategies suggested by these authors highlighted the importance of viewing the transfer of training as a process rather than an outcome. This chapter will also divide the transfer process into the same three time frames in order to highlight strategies that can be implemented at each stage.

Other authors have developed theoretical models that the examine the impact of different training input variables such as trainee characteristics, training design variables, and work environment factors on the transfer process (Baldwin & Ford, 1988). Successful transfer of training to the workplace is not solely determined by any one factor (such as performance on the training program). The employee's level of motivation and ability to understand and benefit from their training are important determinants of the individual's learning outcomes. There are also organisational and contextual factors that are necessary requirements for the effective transfer of training. Kozlowski and Salas (1997) proposed a three-level model incorporating the individual level, the team or unit level, and the organisational level, which expanded how the transfer process was conceptualised. Kozlowski and Salas suggested that within each level there are complex processes involved in transfer of training and that there are also processes by which outcomes at one level combine to emerge as higher-level (that is, unit/team or organizational) outcomes. Therefore, it is proposed that an integrated model of the transfer process should examine strategies that can be applied before, during, and after training at the individual, unit/team, and organizational levels.

Thayer and Teachout's (1995) Transfer Training Model (see Figure 1) focused on several aspects of the training process that affect transfer outcomes. In particular, Thayer and Teachout highlighted the climate for transfer of training, and the transfer-enhancing

activities that occurred during training program as important determinants of transfer. Other variables in the Transfer Training Model included individually oriented variables such as trainee ability, trainee self-efficacy, previous knowledge and skill, reactions to training, and the level of understanding. Locus of control, job involvement, and career attitudes were also included as possible influences on the learning process. The main advantage of this model is that it identifies influences at the organisational level (climate for transfer) that influence individual-level outcomes.

Insert Figure 1 about here

Holton (1996) suggested a similar framework that included three primary outcomes of training (that is, individual learning, individual performance, and organizational results) that are influenced by a combination of motivational, environmental, and enabling factors. In this model, the outcome of individual learning is influenced by the trainee's motivation to learn, the trainee's reaction to the training climate, and the trainee's experience and ability. The outcome of individual performance (after training) is influenced by the trainee's motivation for transfer, the transfer climate, and the design of the training program. Finally, the organizational results achieved are determined by the expected utility of training or return on investment of time and resources, the external events that constrain or amplify productivity, and the linkage between training and the strategic objectives of the organisation. The advantage of Holton's model is that it specified the kinds of intervening variables that influence each of the outcomes and it indicated the directions of causal effects.

The Transfer Training Model (Thayer & Teachout, 1995) and Holton's (1996) model of transfer of training share similar elements such as specifying the trainee

characteristics, training design variables, and work environment factors that impact on the transfer of training. However, these models emphasise the horizontal transfer of training and do not identify strategies or outcomes at the individual, unit/team, and organisational levels that operate at each of the three stages mentioned above to produce vertical transfer of training. An integrated model transfer of training needs to provide a description of the events before, during, and after training that impact on individual and unit/team learning outcomes during training and individual and unit/team performance after training, and the way in which individual and unit/team outcomes subsequently become transformed into organizational outcomes. One way of graphically representing this model is to specify for a particular training program the training inputs, the training outcomes, and the transfer outcomes that would be applicable at each of the three levels. Machin (2000) presented this kind of model in a paper that focused on strategies for enhancing the transfer of training in an aviation team setting (see Figure 2). It is included here as an example of the integrated, multilevel approach that has been described.

Insert Figure 2 about here

Therefore, the rest of this chapter will describe a model of the transfer of training process that is based on the three training stages mentioned in Broad and Newstrom (1992), the multilevel model for training implementation and transfer presented in Kozlowski and Salas (1997) as well as the models of training transfer presented in Thayer and Teachout, and Holton. Strategies will be described that can be applied at each of the three stages, across different levels, taking into account the primary motivational, environmental, and enabling factors that influence the outcomes at each stage.

Pre-training Interventions

Pre-training interventions to improve trainee motivation

Baldwin and Ford (1988) identified three types of individual-level variables that could influence training and transfer outcomes. These include the trainee's level of ability, personality characteristics, and motivation. Although trainee motivation has received the most attention by researchers in this field and is regarded as one of the key influences on the transfer of training process, it is not specifically mentioned in Thayer and Teachout's (1995) Transfer Training Model. Therefore, an integrated model of transfer of training would include the trainees' pre-training level of motivation (an individual level training input) as a determinant of the trainees level of learning (an individual level training outcome). Also, improving trainee's motivation and readiness to benefit from training would be one of the main pre-training interventions aimed at the individual trainee. Examples of pre-training interventions that improve motivation and readiness include: goal setting, participation in decision-making, and providing information concerning the purpose and intended outcomes of training. Each of these interventions will now be described in greater detail.

Goal setting. Goal setting is a powerful technique that has been found to improve performance in many different areas (Locke & Latham, 1990). Goal setting may assist trainees to maximise their transfer of training by focusing on the steps required to achieve their longer-term career outcomes (Hesketh, 1997a). However, goals that emphasise higher levels of work performance may in fact be detrimental to trainee motivation if participation in training is subsequently perceived as a sign that work performance is substandard and if the training program initially involves publicly demonstrating poorer task performance and receiving negative feedback from others (Farr & Middlebrooks,

1990). Therefore, the kinds of goals that might improve trainee motivation would be goals relating to the trainees' level of participation in training and goals relating to the trainees' acquisition of new skills. Supervisors should assist prospective trainees to establish the following kinds of goals:

- to actively participate in all aspects of training (for example, to ask questions where uncertain about a concept),
- to master each of the component skills taught in the training program (for example, to achieve a high level of expertise), or
- to actively practice new skills at the first opportunity (for example, to keep looking for opportunities to apply the skills across a range of settings).

Participation in decision-making. Where possible, trainees should be consulted about decisions regarding their attendance at training courses, including whether they need to attend, when they need to attend, and what mode of attendance would be most suitable for them. However, participation in decision-making may not have a positive impact on trainees' motivation unless the trainees' input is reflected in the training that they receive. Baldwin, Magjuka, and Loher (1991) found that where the trainees' input was not reflected in the training they received, the level of trainees' pre-training motivation decreased as well as the trainees' performance during training. Several steps that supervisors may take to increase trainees' participation in decision-making include:

- asking trainees to nominate the kind of training they wish to receive, when they wish to receive it, how they would like to attend (e.g., full time vs part time, in person vs online), and what they expect the benefits to be in terms of their work performance,

- finding out trainees' reactions to previous training programs they have attended, especially reasons for any negative reactions, and
- allowing trainees to develop their own training programs for specific job-related skills.

Provision of information about training. Trainees need to be given accurate information about the nature of the training program to help them to develop realistic expectations regarding the training program. Cannon-Bowers, Salas, Tannenbaum, and Mathieu (1995) found that subsequent fulfilment of these expectations has been found to create higher levels of motivation, self-efficacy, and organisational commitment. Organisations should ensure that trainees receive positive messages regarding the benefits of each training program in a particular organisational setting, as long as the expected benefits are relevant to the trainee and are likely to be realised. For example, a sales manager may explain to a sales representative how attending an upcoming training program would prepare them to sell a new product that would be released later in the year. Specific statements that supervisors could make to trainees would include explaining:

- how training would enhance their personal skills, especially skills that are essential to their performance at work,
- how training would lead to further positive experiences, such as opportunities to undertake a wider range of work tasks or higher levels of responsibility,
- how training would increase the trainees' control over their work demands, or give trainees greater flexibility in how they perform their main tasks, and

- how training would help to prepare trainees for expected future changes in the workplace, such as the introduction of new technology.

Other factors. Several researchers have examined the relationship between work-related attitudes and pre-training motivation. Noe (1986) suggested that career- and job-related attitudes such as career exploration and job involvement were important influences on trainees' pre-training motivation. While there is little evidence to support these proposed relationships, career exploration and career planning may indirectly on trainees' pre-training motivation through the kind of career plans and goals that the trainee develops.

Organisational commitment may also have a positive link to pre-training motivation. Organisational commitment is the individual's sense of attachment to the organisation and the actions that they take as a result of this attachment (Meyer, Allen & Smith, 1993). Facteau, Dobbins, Russell, Ladd, and Kudisch (1995) found that individuals who were committed to the values and goals of the organisation had higher levels of pre-training motivation. Cannon-Bowers et al. (1995) found that organisational commitment was positively related to pre-training performance expectations and training desires, and that all three were positively related to pre-training motivation. Therefore, organisational commitment may be an indicator of trainees' level of readiness to undertake and benefit from training. Low levels of organisational commitment may also be a reflection of the climate existing in the workplace, and the need for improvements to occur at this level. Strategies for improving organisational climate will be discussed in a later section.

Pre-training interventions to improve trainee self-efficacy

A great deal of research has focused on the role of trainee self-efficacy. Self-efficacy, which is defined as a person's judgement of their capabilities to organize and execute courses of action required to attain a specified level of performance (Bandura, 1997), plays a powerful role in determining the choices that people make, the effort they will expend, how long they will persevere in the face of challenge, and the degree of anxiety they experience. Self-efficacy is regarded as a stronger influence on behaviour than one's knowledge and skills, while strong feelings of self-efficacy can motivate intensification of effort and persistence in the face of setbacks. Haccoun and Saks (1998) concluded that level of self-efficacy is one of the main determinants of whether an individual will benefit from training and transfer their training to the workplace. Pre-training self-efficacy (another individual level training input) is included in Thayer and Teachout's (1995) Transfer Training Model as a determinant of individual learning outcomes.

Haccoun and Saks (1998) presented a self-efficacy intervention framework that described how the four major sources of self-efficacy information may be integrated into the three stages of training to demonstrate how and when to intervene to improve trainee's self-efficacy. They proposed that interventions prior to and subsequent to training that would be most beneficial in improving self-efficacy should focus on verbal persuasion and physiological states of arousal. Trainees most likely to benefit from these interventions would be those with low levels of pre-training self-efficacy or higher levels of pre-training anxiety. Supervisors should focus their assistance on employees who have experienced a series of difficulties such as poor performance, failure to transfer skills from previous training, or who express strong reservations about their ability to master

the training. Some strategies that might be useful in improving pre-training self-efficacy would include:

- reducing any perceived threat to the trainee by initially emphasising the learning outcomes and de-emphasising performance outcomes (although the performance outcomes are extremely important after training),
- helping the trainee to develop better learning strategies to use during training, such as summarising the main points, use of mnemonics to aid retention, and planning for frequent revision of material, and
- developing a plan for how the trainee will utilize the skills that they will learn during training. This last point is explained further in the next section.

Pre-training interventions to improve organisational climate

Thayer and Teachout's (1995) Transfer Training Model portrays climate for transfer (also called the transfer climate) as only influencing transfer outcomes after training. However, the organisational climate for transfer of training (an organisational level training input) may also have an influence on trainees' pre-training motivation and self-efficacy (Baldwin & Magjuka, 1997). The transfer climate includes situations and actions that convey the support of management for the transfer of training as well as the value that the organization places on trainees successfully transferring their training (Rouiller & Goldstein, 1993). Other aspects of the transfer climate would include specific situational constraints that restrict use of skills in the workplace and the opportunities that exist for use of skills on the job. Where there is a perceived lack of management support for the transfer of training or a perception that the transfer of one's training is of little value to the organisation, there is little incentive for trainees to invest the effort required

to master the content of the training. Therefore, prior to training commencing, it is important to ascertain the trainees' perceptions of management support for the training they will receive as well as the trainees' expectations that correct use of skills learned during training will be positively rewarded. Supervisors can assist trainees prior to training by doing the following:

- working with the trainee to identify external factors that may restrict the trainee's ability to utilize their new skills in the workplace (for example, will the correct equipment the available after training?),
- assisting the trainee to identify organisationally valuable outcomes from training (for example, will training assist the trainee to improve the quality of their work or the more competitive in an application for promotion?), and
- contracting with the trainee to provide positive reinforcement and desirable rewards that should be contingent on the trainees correct use of the skills learned during training. This may be a difficult outcome for a supervisor to monitor but specific criteria should be established against which transfer can be assessed.

Haccoun and Saks (1998) argued that training which is not supported by organisational change efforts is likely to be ineffective. Training managers will have to consider all of the environmental constraints within which training operates and focus on providing the kinds of training that are aligned with their organisation’s strategic directions.

Summary of pre-training interventions

Pre-training interventions focus on improving the individual and organizational readiness to benefit from training in three main areas: improving trainees’ pre-training

motivation, enhancing trainees' pre-training self-efficacy, and improving trainees' perceptions of organizational support for training. These goals and strategies are summarised in the first column in Table 1. The next section will describe some of the learning principles derived from experimental psychology and how they have been applied to the design of training programs to optimise transfer of training. There are also strategies aimed at improving trainees' transfer intentions and reactions to training that incorporate the unit/team level.

Insert Table 1 about here

Interventions during Training

Interventions during training to improve learning and expertise

Baldwin and Ford (1988) reviewed the organisational training literature to determine basic learning principles that impact on individual training outcomes or transfer of training. While individual learning is incorporated in Thayer and Teachout's (1995) Transfer Training Model as an individual level outcome of training, expertise is a newer concept that is receiving a great deal of attention. The research relating to enhancement of individual learning will be discussed first, followed by a description of research into enhancement of adaptive expertise.

Baldwin and Ford cited the work of McGehee and Thayer (1961), who found that the majority of the empirical research linking learning principles to the design of training could be summarised into four basic principles. These were: (1) the use of identical elements (that is, making the training setting similar to the work setting), (2) the teaching of general principles (that is, outlining a principle that can be applied across a range of problems or situations), (3) the provision of stimulus variability (that is, using a variety of

examples to illustrate a principle), and (4) the conditions of practice (that is, how often trainees practice the tasks, what kind of feedback is provided, and how complex tasks are simplified). While these principles have been extensively researched from a behaviourist perspective, recent research from a cognitive, information processing perspective has highlighted a number of areas in which the impact on transfer of learning is markedly different from that predicted from earlier research (Druckman & Bjork, 1991, 1994). Strategies derived from each of the four principles will be described, followed by strategies that focus on the development of adaptive expertise that is not confined to a particular setting.

Identical elements. Many studies have demonstrated that transfer of learning occurs most often between highly similar situations, but that there is little positive evidence of transfer generalizing to different situations (Singley & Anderson, 1989). When the physical characteristics of the transfer environment match the learning environment, the actual stimuli may be identical. This occurs when equipment used in training is identical to that used in the work place. However, this view of identical elements may be too narrow. Holding (1991) suggested that functional fidelity may be achieved when the psychological meaning attached to two situations is identical, even without a high level of similarity of the physical environments. For example, with regard to the use of flight simulators to train novice pilots to fly, Lintern (1991) concluded that the level of detail provided in flight simulators only needs to be sufficient to provide trainees with the most relevant information (such as speed, direction, and altitude), and not identical in every detail. Therefore, it is likely that a greater level of physical fidelity would not enhance the overall transfer of the trainees' skills, provided that the

appropriate level of psychological or functional fidelity is achieved in the training setting. Therefore, in order to maximise psychological fidelity, trainers need to ensure that:

- an explanation is provided to trainees of any dissimilarity between the tasks performed during training and work tasks that will be performed after training,
- trainees are encouraged to focus only on important differences between training tasks and transfer tasks (such as the speed with which the training tasks are performed), rather than non-essential differences (such as using equipment that is not the same model but has the same features), and
- the procedures used in training are similar to those used in the work place, or where they do differ, that trainees can make the necessary adjustments to accommodate the different procedures.

General principles. The teaching of general principles or problem solving strategies that can be applied across a range of problems or situations has only been able to demonstrate a limited beneficial effect, even though many studies have been conducted (see Detterman, 1993). Essentially, the teaching of general principles is an example of "high-road" approach to transfer (Salomon & Perkins, 1989) that focuses on assisting learners to develop abstract schemas that can be applied across a number of different types of situations. The "low-road" approach to transfer involves the development of context-specific skills that, after a great deal of practice, become fairly automatic. The development of abstract schemas has yet to be shown to benefit the transfer of learning in a general sense, and it also may be harder for the learner to grasp the principle in the early stages of learning new material. Therefore, the potential benefits of using general principles must be weighed against the possible reduction in trainees' motivation during

training. Ivancic and Hesketh (1995/96) suggested that in order to enhance understanding of a principle, training should incorporate strategies designed to:

- capture the trainee's attention, such as presenting a real-life problem that the trainee is familiar with,
- provide feedback about the accuracy of the trainee's knowledge structures (this provides the trainee with an awareness of their training needs), and
- direct the trainee's attention to similar examples from their own experiences, so that the trainee can make connections between strategies that have been effective across different situations.

Stimulus variability. The use of a variety of examples during training to illustrate a principle is a strategy that may assist trainees to develop an understanding of general rules that could be transferred to other situations. The trainee does this by learning to recognize the common features of the examples. Gick and Holyoak (1987) identified the need for trainees to differentiate between the structural and surface components of situations. While the surface components may be varied to assist trainees to develop general rules, the structural components need to be consistent for transfer of learning to occur. As an example of the difference between structural and surface components, consider a training program in how to provide performance feedback to subordinates. The surface components of the examples could be varied to include a male supervisor with both male and female employees and then a female supervisor with both male and female employees, examples of supervisors providing both positive and negative feedback with different employees who either accept or reject the feedback, and a supervisor who is very formal and keeps at a distance from the employee versus a supervisor who is

informal and choses to sit closer to the employee. The structural components that would need to be kept consistent would include the use of specific, behavioural examples of both good and poor performance, providing opportunity for the employee to ask questions, or disagree with comments made by their supervisor, and including the employee in the development of strategies for how they might improve areas of poor performance.

Baldwin (1992) reported that the inclusion of both positive and negative models in a behavioural modelling program had a significant negative effect on initial learning, but a significant positive effect on transfer to a different task. Other research has confirmed that the use of a variety of examples does benefit the transfer of skills, but that it may have a negative effect on initial skill acquisition (Schmidt & Bjork, 1992). Therefore, evaluations of the effectiveness of training should be based on the immediate training outcomes as well as longer-term transfer outcomes as displayed in the model in Figure 2. Trainers may incorporate stimulus variability into training by:

- providing different examples during training and highlighting the important features of each example,
- providing both positive (what to do) and negative (what not to do) examples, and
- being aware that trainees may experience initial confusion but that this that does not translate into poorer performance on the transfer task unless they fail to demonstrate mastery of the training content.

Conditions of practice. Areas that Baldwin and Ford (1988) included under conditions of practice were issues such as the degree of overlearning (that is, how long trainees continue to practice their tasks), the frequency and type of feedback, the

distribution of practice (that is, how often the trainees practice their tasks), and whole- versus part-task training (that is, how complex tasks are simplified during training).

Overlearning involves continuing practice well beyond the point at which trainees are able to successfully perform a task, and is related to the likelihood that material learned during training will be retained after training. While there is an initial positive effect on transfer, the benefits of overlearning appear to weaken with time (Driskell, Willis, & Cooper, 1992). Also, trainees only need overlearn those task components that are consistent across a range of transfer conditions (Proctor & Dutta, 1995). Therefore, overlearning is suggested as a strategy that is best used for tasks that are routine and where the structure of the tasks remains consistent after training such as with standard pieces of equipment. The military has enshrined this principle in their weapons training, where trainees are drilled to the point where weapons assembly is done automatically.

Feedback is regarded as one of the most important strategies by which learning is improved. When feedback is gradually reduced during skill acquisition, the individual learner is encouraged to develop self-regulatory skills that enhance their ability to generalise their learning beyond the original task. Kluger and DeNisi (1996) warned that if feedback focused the individual's attention away from the task towards more general processes, it may promote a superficial level of understanding, and have a negative effect on transfer. Hesketh (1997a) noted that a distinguishing feature of experts is the accuracy of their own self-assessments. Therefore, the provision of feedback cues may enhance learning and transfer if the feedback initially specifies how task performance may be improved and if the trainee learns to recognize their own weaknesses and correct their

own performance. This procedure is also discussed below in the section that examines self-management strategies.

Spacing training over a number of sessions, so that training sessions are separated by other activities has been found to benefit the long-term retention of learning (Schmidt & Bjork, 1992). However, there is a strong tendency in many organisations for training sessions to be grouped, that is, conducted all within one time period with no other activities between sessions. While trainees receiving massed practice may appear to demonstrate satisfactory learning outcomes, this is usually only the case for when short-term results are considered (Druckman & Bjork, 1991). Hesketh (1997a, 1997b) recommended several changes to overcome this reliance on strategies such as the grouping of training sessions that promote short-term training outcomes, including a focus on the measurement of different types of training outcomes such as cognitive (what I know), behavioural (what I do), and affective (what I feel or value) outcomes over longer periods (for example, six months later, one year later, two years later etc.). These are suggestions that trainers are starting to incorporate into their training evaluations.

Finally, the issue of whole- versus part-task training concerns the way that complex tasks are simplified during training. In many cases, trainees are trained to perform the components of a task separately before being required to integrate the components. For example, surgeons perform tasks such as making incisions, tying sutures, and clamping blood vessels separately many times before actually performing an operation. While some authors have suggested that part-task training can be effective, particularly where the task is easily decomposed into unrelated subtasks, other authors have questioned these findings (Schmidt & Young, 1987). Another factor that impacts on

the effectiveness of part-task training are the strategies that are employed to decompose the task during training, and then reconstruct the whole task at transfer. Druckman and Bjork (1991) outlined a number of difficulties that are encountered in recombining part-tasks, especially the need to integrate task components and generate new responses to the same stimuli. Therefore, the research on part-task training suggests that this strategy may only improve trainees' learning and transfer outcomes where the tasks are easily decomposed into separate and unrelated components. Part-task training may not be suitable for many of the complex, highly integrated tasks that are commonplace in much of today's training.

To summarise the section on conditions of practice, there is a growing need to design training that does not concentrate only on short-term, behavioural outcomes, but promotes longer-term skill development. Part of the solution involves a new understanding of the importance of cognitive processes in training and transfer. The next section will describe specific strategies that focus on the development of adaptive expertise, where the emphasis is on skills and knowledge that can be applied across a range of situations.

Adaptive expertise. Training researchers are increasingly focusing on the development of adaptive expertise as one of the most important outcomes of training (see Hesketh, 1997a, 1997b; Smith, Ford, & Kozlowski, 1997). Traditionally, many training courses were designed to promote "routine expertise", that is, where trainees reproduced specific behaviours in similar settings with an emphasis on short-term retention, rather than "adaptive expertise" that can be applied across a range of complex tasks and settings. Training which has the goal of developing adaptive expertise may require some

radical changes in training design and a focus on the evaluation of different types of learning outcomes (Smith, et al., 1997). Ford and Weissbein (1997) identified three training design features that have the potential to improve adaptability and effectiveness of training transfer. These were use of discovery learning, use of error-based learning, and development of trainees' metacognitive skills. These will be briefly described and illustrated with examples. It is more difficult to provide specific strategies that enhance adaptive expertise as this is a much newer area of research.

Discovery learning occurs when trainees are given the opportunity to explore and experiment with aspects of the training material and thereby infer general rules and strategies. Guidance is provided in the way of answers to questions, asking leading questions, or providing prompts without giving specific answers (Kamouri, Kamouri, & Smith, 1986). Discovery learning allows a trainee to be more involved and actively engaged in the learning activity (Singer & Pease, 1976), while assisting the trainee to acquire several learning strategies involving greater levels of conscious attention in their application (McDaniel & Schlager, 1990). Individual learners may also become more aware of which strategies are most effective in novel situations. Frese and Zapf (1994) pointed out that self-generated knowledge is more easily integrated into existing knowledge, and also able to be applied more flexibly, across different situations. Discovery learning could be incorporated into training by using case studies of real-life situations that require trainees to identify appropriate responses that were effective in a more than one situation. For example, trainees may be asked to generate real-life situations and then describe several different ways of responding. In the process of

producing different responses, the trainee is learning to differentiate between those that are more effective and those that are less effective.

The second approach to enhancing adaptability has focused on error-based learning (Ivancic & Hesketh, 1995/96). Error-based learning differs from guided discovery learning in that learners develop specific error-management strategies that assist them to improve their learning and deal with the motivational consequences of errors. Hesketh (1997a) emphasised the important role that errors play in testing hypotheses about underlying knowledge structures. Frese and Altman (1989) also linked the active processing of errors to the refinement of a trainee's mental model. Error-based learning could be used to assist trainees in developing their own mental database of the different kinds of errors that are possible and what steps can be taken to prevent each kind of error. This may be particularly effective in training for expertise in fault-finding procedures, where the initial stimulus is a breakdown in a system (such as a process control system in manufacturing) or a piece of machinery (such as a photocopier).

The third approach focused on the development of metacognitive skills. Metacognitive skills are the skills that enable the learner to be consciously aware of, and in control of their cognitive processes, including their learning and application of new knowledge and skills (Butterfield & Nelson, 1989). Hesketh (1997a) suggested that metacognitive skills promote adaptability of expertise by allowing the strategic use of the various components of expertise such as processes involving planning, monitoring, and evaluating one's own performance. Smith et al. (1997) outlined two avenues by which metacognitive skills may be developed. These are by increasing the degree of control that learners exert over the learning process, and by cultivating a mastery orientation towards

the learning task. Volet (1991) has shown that students who received metacognitive skills training received better grades in their course, and were better able to apply their knowledge to solving new problems. Examples of metacognitive skills training would include training in the way the trainees think about their learning (see Downs & Perry, 1984, for a learning-to-learn training program), how trainees solve different kinds of problems (see De Bono, 1985, for a description of a course in lateral thinking), and the strategies that trainees use to transfer their training (see below for a description of relapse prevention training).

Smith et al. (1997) concluded that use of strategies such as the three outlined above may enhance the adaptability of trainees' expertise to the extent to which they assist trainees to develop detailed, well-integrated knowledge structures, and self-regulatory skills such as planning, monitoring, and self-evaluation. Other interventions can be used during training that focus on improving the trainees' transfer intentions. These will be discussed in the next section.

Interventions during training to improve transfer intentions

Foxon's (1993, 1994) model of the transfer of training process begins with the trainee's intention to transfer and their subsequent attempts at initiation, followed by partial transfer, conscious maintenance and finally unconscious maintenance of their new skills. Foxon's model incorporated the multi-level aspects already mentioned such as components of organisational climate, and also highlights the importance of trainees' transfer intentions. Interventions designed to improve trainees' motivation to transfer and level of self-efficacy will assist in the development of stronger transfer intentions, which are one of the preconditions for effective transfer of training. Transfer intentions is not

specifically mentioned in Thayer and Teachout's (1995) Transfer Training Model, but would be a separate individual level training outcome that preceded actual transfer of training, and would be influenced by the same three factors in the model, that is, post-training self-efficacy, learning, and transfer-enhancing activities that occur during training. The most direct strategy for improving transfer intentions is through the use of in-training transfer-enhancing activities such as goal setting, the development of specific implementation plans for achieving one's transfer goals, and relapse prevention, which is a strategy for preparing trainees to deal with the problematic situations they may face after training. All three of these strategies will be described in more detail.

Goal setting. Setting specific goals for the transfer of training has been found to assist trainees to maximise the level of transfer that occurs, although goal setting may be most effective for those trainees with higher levels of self-efficacy (Stevens & Gist, 1997; Murtada & Haccoun, 1996). Latham and Seijts (1999) recommended that trainees should set short-term goals as well as long-term goals because short-term goals provide trainees with more immediate opportunities for successful outcomes that will lead to higher levels of self-efficacy and further goal attainment. Latham and Seijts advocated that short-term goals should be set both for knowledge and skill acquisition during training, and then for maintenance and generalisation of the knowledge and skills learned after training. Hesketh (1997a) stated that goal setting might also assist trainees to strive for longer-term outcomes (such as career goals) that appear less attractive due to the delay in achieving them. Therefore, trainers should ensure that all trainees have:

- clear, short-term learning goals for the training program (for example, "I will complete all of the required units/modules in the allocated time"),

- short-term goals for the immediate transfer of their training (for example, “I will begin to use my new skills at the first opportunity”), and
- longer-term goals that focus on the continued development of the trainee’s level of mastery of the training content (for example, “I will seek feedback from my supervisor/peers after one month and continue to review my progress each month”).

Implementation plans. Gollwitzer (1999) proposed that there are two kinds of intentions that impact on goal achievement: goal intentions and implementation intentions. Goal intentions were defined as specifying a desired end state, as well as some level of commitment to achieving that end state. Gollwitzer defined implementation intentions as specifying the situational cues or conditions that trigger goal-directed actions. That is, this kind of intention is a commitment to act in a certain way whenever certain conditions are fulfilled. Therefore, implementation intentions can make salient to the individual those aspects of the environment that are relevant to the achievement of their goals.

The kinds of implementation intentions that are relevant to the transfer of training are likely to be intentions to use the transfer enhancement procedures such as goal setting, self management, and relapse prevention that are effective in promoting the transfer process (Machin & Fogarty, 1998). Other activities that might promote transfer include seeking support from supervisors and peers, as well as practicing the skills learnt in training, and looking for opportunities to demonstrate the skills learnt during training. Trainers can encourage trainees to examine the various situations in which they will use their training and commit to specific implementation plans such as those described

below. The crucial step is that trainees decide before they finish training what they will attempt after their training has finished. Trainers could ask trainees:

- what is the first thing you are going to do when you get back to your job?
- when is the best time and under what specific conditions should you initiate use of the skills learned during training?
- what specific goals do you have for the maintenance of your skills (this might include a plan to establish specific levels of mastery at certain key points)? and
- what kind of positive reinforcement do you expect from your supervisor or peers (recognising that supervisors and peers may have limited time and few opportunities to directly observe the trainees performance after training)?

Relapse prevention. Relapse prevention (RP) training has been recommended as a key strategy for enhancing transfer of training (Marx, 1982). This strategy is designed to assist trainees in the period immediately after training, regarded by some researchers as the most crucial period in facilitating positive transfer (Tannenbaum & Yukl, 1992). Relapse prevention training originated in the field of clinical psychology and was developed to improve the likelihood that people recovering from addictive behaviours would be able to anticipate and effectively deal with difficult situations without relapsing into their former addictive behaviours (Marlatt & Gordon, 1985). The focus of RP training was to develop high levels of self-efficacy for identifying problematic situations and exercising control over one's behaviour using appropriate coping strategies. For a trainee, it will not be exposure to alcoholic beverages that constitutes a high-risk situation, but perhaps situations such as criticism from the trainees' supervisor and/or peers, or coping with increased time pressures in order to meet several deadlines.

Tziner, Haccoun and Kadish (1991) demonstrated that training that incorporated an RP module was found to be more effective in that trainees reported greater use of the transfer strategies they had learned and supervisors judged those trainees as demonstrating greater use of their trained skills. The trainees who received RP training also demonstrated higher levels of mastery of the training content, although the reason for this is unclear as the RP module was not equally effective for all trainees in all situations, with transfer being influenced by personal and situational elements extraneous to the training intervention. Trainers should encourage trainees to identify specific situations where they may be at risk of failing to utilize their training and ask the trainees to develop an action plan that includes:

- a description of the specific, challenging situation where they will be required to use their skills (such as when an aircraft crew faces a series of delays, extra demands, and adverse weather conditions),
- an explanation of what skills they will be applying (such as situational awareness, communication, and decision-making techniques appropriate for aircraft crew that may have been learned in crew resource management training),
- the results that they expect from an improvement in their performance (such as enhanced aircraft safety through maintenance of safety margins, and reduced disruption to passengers' plans),
- a description of any potential obstacles to the implementation of their plan (such as unpredictability of weather conditions and subsequent delays), and

- a description of how they would deal with those obstacles (such as the use of standard operating procedures that emphasise safety and communicating relevant information about delays to passengers to enable them to make alternative plans).

Haccoun (1997) described RP as a strategy which focuses on "the development of proactive, strategic actions that take into account work level constraints" (p. 342) and therefore may have an impact on trainee's expectations that the training can be successfully transferred. The action plans may be crucial in the period immediately following training when trainees are most susceptible to the influence of barriers to transfer in the workplace. Also, these procedures assist trainees to attribute failures to transfer their training as being deficits in the use of transfer strategies, rather than deficits in motivation or ability. Haccoun and Saks (1998) recommended that trainers should use a contingency approach to the implementation of strategies such as RP, taking into account the characteristics of the trainee, the task that is being learnt, and the training and transfer environment.

Interventions during training to improve reactions to training

Thayer and Teachout's (1995) Transfer Training Model portrays trainees' reactions to the current and previous training courses as an individual level training outcome that is a determinant of individual learning. However, there may be a contextual influence of the training environment on individual reactions to training, as well as individual learning outcomes. Contextual factors that may influence individual reactions to training involve characteristics of the training cohort (Baldwin & Magjuka, 1997), and aspects of the training climate (Choi, Price & Vinokur, 2000), which are both group level training inputs.

Training cohort. Training cohort variables include the size and composition of the training group and norms for the degree of cooperative learning required. Baldwin and Magjuka (1997) proposed that trainees do take careful note of who else attends training and the degree of cooperation that is expected from trainees, or for which trainees are rewarded. Depending on the type and purpose of the training, there are arguments that can be made for having relatively homogenous or heterogeneous training groups. However, the trainees would not necessarily share the same understanding of these reasons as those in management responsible for making them. Baldwin and Magjuka concluded that there is currently little evidence to support the notion that small, relatively homogenous groups will result in better training outcomes.

There is however growing evidence to support the value of cooperative learning as a means of enhancing training performance (Latham & Crandall, 1991). The major factor in promoting cooperative learning is the development of supportive group norms. When group success depends on all group members improving their performance, it is expected that group members will encourage each other and support cooperative learning (Slavin, 1983). Therefore, trainers need to carefully analyse the extent to which transfer of training will depend on the cooperation and support of other employees and ensure that during training the same level of support and cooperation is provided to trainees. Specific ways in which trainers can encourage trainees to support one another include:

- establishing ground rules that do not permit trainees to criticise one another,
- the trainer models the kind of support and encouragement that is expected from trainees, and

- using team-building exercises to create a climate of acceptance within the group as well as an increased awareness of intra-group processes.

Training climate. The training climate has been the focus of numerous studies that involved assessments of school and tertiary classroom settings in order to determine the impact of the learning environment on student achievements (Fraser, 1981). There is also evidence that supportive and encouraging interpersonal relationships in the training environment between trainer and trainee are associated with better levels of well-being in unemployed trainees, and with improvements in well-being across time (Creed, Hicks & Machin, 1996).

Choi, Price and Vinokur (2000) identified several group-level effects that have the potential to influence individual-level outcomes, including providing a safe group-learning environment, a positive group atmosphere, mutual support among group members, and trainers with strong referent power. Choi et al. found that leadership processes that included leader behaviour and leader social attractiveness influenced trainees' mastery of the training content when measured at the individual level. However, group processes that included group climate and social attractiveness of the group influenced individual-level outcomes as well has showing an additional contextual effect for the whole group. That is, while trainees who had positive group experiences reported more positive outcomes, those trainees who were surrounded by others who shared their positive group perceptions were able to achieve even greater positive outcomes. Therefore, trainers need to ensure not only that individuals have positive experiences with the group, but also these perceptions are shared by other group members. This is an important contribution to understanding the multi-level nature of the processes involved

in transfer of training and in particular the way in which individual-level outcomes are embedded in higher-level (that is, group and organisational) processes.

Summary of interventions used during training

Interventions applied during training have been described that focus on three main areas: improving trainees' learning outcomes (including their level of adaptive expertise), improving trainees' transfer intentions, and improving the trainees' reactions to training. The key concepts underlying these interventions are the individual's readiness to transfer their training, the identification of potential barriers to the transfer of training, and the importance of understanding contextual effects on individual learning outcomes. These goals and strategies are summarised in the second column in Table 1. The next section will describe post-training strategies that can be used to optimise the transfer of training and further elaborate on the importance of considering contextual processes.

Post-training Interventions

Post-training interventions to improve the climate for transfer

Baldwin and Ford (1988) proposed that characteristics of the work environment influenced training and transfer outcomes. Examples of aspects of the work environment that may impact on transfer included: situational constraints, support from one's supervisor and peers, and opportunity to use one's knowledge and skills on the job. Specific climate for transfer factors will be described in greater detail and illustrated with examples.

Peters, O'Connor and Eulberg (1985) identified specific groups of situational constraints that may affect work performance. They suggested that there are 11 basic

categories of constraints, and these include: job-related information, tools and equipment, materials and supplies, budgetary support, required services and help from others, task preparation, time available, work environment, scheduling of activities, transportation, and job-relevant authority. While not all of these constraints are relevant to the transfer of knowledge and skills acquired during training, some factors are relevant to the design of training. For example, “Are the tools and equipment the same as those used in training?” Other constraints may affect the actual transfer of training, for example, the work environment and scheduling of activities (similar to opportunity to perform). Therefore, constraints operate in all areas of the work environment and can be barriers to transfer of training.

Building on the earlier work on situational constraints, Rouiller and Goldstein (1993) developed a model of the transfer climate based on social learning theory (see Luthans & Kreitner, 1985). Rouiller and Goldstein model was composed of situational cues (for example, goal, social, task, and self-control cues), and several types of consequences (for example, positive feedback, negative feedback, punishment, and no feedback). Situational cues served to remind trainees of their training or provided them with opportunities to use their training, while consequences affected the likelihood that trainees would continue to use their skills. Rouiller and Goldstein’s found that both types of components were important in predicting transfer of training. Where a more positive transfer climate existed, trainees demonstrated significantly more trained behaviours, even after controlling for learning and unit performance.

Tracey, Tannenbaum, and Kavanagh (1995) attempted to replicate and expand on the work of Rouiller and Goldstein (1993) by evaluating transfer of training among

supermarket managers using separate measures of transfer climate and continuous-learning culture. Both transfer climate and continuous-learning culture were directly related to post-training behaviours, even after accounting for pre-training performance and knowledge learned during training. Tracey et al. found that the social support components in both the climate and culture measured had the strongest relationships with the underlying constructs being measured. This indicated that the extent to which supervisors and coworkers encouraged the learning and use of trained skills on the job might be the crucial elements in the transfer environment.

Another line of research has focused on factors that influence trainees' opportunity to perform trained tasks on the job (Ford, Quiñones, Sego, & Sorra, 1992; Quiñones, Sego, Ford, & Smith, 1995/96). These studies, which involved graduates from United States Air Force (USAF) training courses, found that supervisor attitudes and workgroup support both affected the opportunity trainees received to transfer their training. Other determinants of opportunity to perform included individual characteristics such as trainee self-efficacy and career motivation, even after the organisational and work context factors were taken into account.

Therefore, in order for trainees to effectively transfer their training, the transfer climate must contain the antecedents necessary for the transfer of training and ensure that trainees receive suitable consequences such as positive reinforcement. Machin and Fogarty (2000) suggested that there are different strategies that trainers and supervisors would use to enhance the positive aspects of the climate for transfer and reduce the negative aspects of the climate for transfer. Strategies to improve the positive aspects include:

- providing trainees with specific goal cues that target improved performance resulting from transfer of training (these may be self-set or assigned goals),
- providing trainees with social cues where supervisors and fellow workers are supportive of the trainees' attempts to transfer their training,
- providing trainees with appropriate task (or structural cues) such as access to equipment or resources that are essential to the transfer of their training,
- providing positive reinforcement (such as recognition in a company newsletter or staff-member-of-the-month scheme) to those trainees who demonstrate better performance through the transfer of their training, and
- making a link between trainees' transfer of training and their access to further training as well as their future job success.

Strategies to reduce the negative aspects include:

- reducing the situational constraints that may prevent trainees from transferring their training such as lack of time or opportunity to perform the tasks they learned during their training,
- reducing the likelihood of trainees being criticised by their supervisors or peers by using an approach where all members of a work unit are trained at the same time, and
- reducing the likelihood of continued poor performance after training through improved monitoring of post-training performance.

Post-training interventions to improve the *vertical* transfer of training

The term "vertical transfer" has been coined to describe the process whereby individual level performance outcomes combine to determine higher-level outcomes such

as unit/team outcomes, or organisational performance (Brown, Weissbein & Kozlowski, 1998). Where individual performance is combined additively across individuals such as in a typing pool, the process is known as composition (Rousseau, 1985). In this situation, any one individual has a small impact on the group's overall performance. However, when the performance of the team depends on a minimum contribution from one or more members such as with an aircraft crew, the process is know as compilation. In this situation, transfer of each individual team member's training is critical for team performance. Cannon-Bowers and Salas (1998) described how transfer of training to team settings may require a better understanding in several areas. They suggested that further research was required to identify and establish techniques for analysing team tasks. Another area requiring research involved further exploration of the issues associated with team cognition. A final area involved developing a better understanding of ways to foster a continuous learning environment in teams. The Transfer Training Model (Thayer & Teachout, 1995) includes organisational results as an outcome of transfer of training, but does not distinguish between the different processes (composition versus compilation) that operate to determine group-level outcomes.

Therefore, when transfer of training occurs in a team environment, particular attention must be paid to the mechanisms by which an individual's knowledge and/or skills are transformed into a team's overall performance. Kozlowski and Salas (1997) offered a number of suggestions for improving the vertical transfer of training (that is, where group-level outcomes are mainly dependent on compilation processes), including:

- that training should be delivered at the unit/team level (that is, to intact units/teams) whenever the role of each team member is critical to the team's performance and there are no redundant team members,
- that units/teams need to receive training that specifically develops the shared knowledge and understanding of unit/team members, rather than simply focus on individual knowledge and skill development, and
- that training for units/teams may need to include all unit/team members simultaneously in order to achieve the same level of reciprocity in training that occurs in the work environment.

In terms of the effect of the organisational context on the vertical transfer of training, Kozlowski and Salas (1997) proposed that:

- the aspects of the climate for transfer of training that are relevant in any particular situation will depend on the nature of the training provided, with only those aspects of the transfer climate that are aligned with the training content having an influence on the transfer process,
- training that is inconsistent with the defining values and culture of the organisation is less likely to be supported, and
- organisations that promote a culture of continuous learning and align their human resource practices with the strategic directions of the organisation will create a positive climate for the transfer of all types of training.

Summary of post-training interventions

Post-training interventions have been described that focus on improving the climate for the transfer of training, and improving the vertical transfer of training. The

key concepts underlying these interventions are the effect of the organisational context on trainees' implementation of their training, the need to understand the compilation processes that operate when training unit/team members, and the importance of aligning training with organisational goals and directions. These goals and strategies are summarised in the third column in Table 1. The final section will discuss the difficulties and challenges that face trainers, supervisors, and trainees who attempt to implement the pre-training, within-training, and post-training interventions outlined in the three previous sections.

Conclusions and final thoughts

The pre-training interventions focused on improving trainee motivation, enhancing trainee self-efficacy, and improving perceptions of organizational support for training. Interventions applied during training focused on improving trainees' learning outcomes, improving trainees' transfer intentions, and improving the trainees' reactions to training. Finally, the post-training interventions focused on improving the climate for the transfer of training, and improving the vertical transfer of training. These strategies are the results of synthesizing the most up-to-date research in the area and can be applied by trainers, supervisors, or in some cases by the trainees themselves.

There has not been any consideration so far of the costs associated with each of the interventions or the relative difficulty of different strategies. For example, where there was very little opportunity for a trainer to control the composition of the training group or the expectations that trainees have prior to the course, it is important that soon after the commencement of training, the trainees have the opportunity to set appropriate learning goals, to participate in making decisions about the training course, and to start planning

how they will implement their training in their workplace. Trainers also need to identify very early those trainees who may be threatened by the type of training that is being provided or who are “at risk” of not being able to fully participate in the training program. This may occur if a trainee does not attend all sessions as often happens when the training is spaced over a number of weeks.

Another situation faced by trainers is that they have very little control over what happens after training and whether trainees are rewarded for the implementation of the skills learned during training. One strategy may be to prepare trainees to deal with the worst scenario that they may face, that is, a totally negative climate for transfer, so that they do not become discouraged after their first attempts to implement their training. However, this may have the effect of reducing trainee motivation to learn and transfer their training. The key to managing the transfer process is to prepare contingency plans specifying all of the barriers and setbacks that can be anticipated and the appropriate course of action to follow. Training that does not prepare trainees to deal with the post-training environment is quite likely to be ineffective and demotivating.

Trainers may also struggle to assess the extent to which training develops adaptive expertise, as the core attributes (a detailed, well-organised knowledge structure and meta-cognitive skills) are difficult to measure. Simple, behavioural measures of training outcomes are usually preferred (for example, a behavioural checklist that a supervisor may check off) and these are usually administered at the end of training or shortly afterwards. However, this practice has the potential to focus attention on short-term behavioural outcomes rather than the long-term development of expertise. While

trainers need to make use of a greater variety of assessment instruments that capture some of the core elements of adaptive expertise, these are not yet readily available.

The organisational climate for transfer of training has been shown to have a strong impact on training and transfer outcomes in two ways. The first is an indirect impact through the trainees' pre-training motivation and expectations of being able to implement their training, while the second is a direct impact on the opportunities for trainees to perform according to their training and the degree of support and encouragement they receive from supervisors and coworkers. Training needs to go hand-in-hand with efforts to improve the organisational climate for transfer, although this is not typically attempted in training and development programs. One proposal is that the traditional training needs analysis be replaced with a Transfer of Training Needs Analysis (TTNA; Hesketh, 1997b) that identifies organisational constraints to the transfer of training. In some cases, the TTNA may conclude that transfer is very unlikely to occur and that training should be delayed or abandoned.

Finally, the focus of training needs to shift from a purely individual level to include the unit/team and organisational levels. Many employees work in self-managing teams and, in some situations, these teams cannot operate effectively without each team member fulfilling their particular role. However, training courses have often focused on the individual team members' knowledge and skill rather than the shared understanding of the team, and have been delivered to team members at different times, rather than incorporating intact teams. A better methodology is needed (such as better ways to analyse team tasks) to assist trainers to identify when training is required at the unit/team level.

The reality is that training will sometimes be delivered in an organisational context that is not supportive, with trainees who have little motivation or interest, and with a focus on achieving short-term outcomes that do not contribute to desirable unit/team or organisational outcomes. However, the growing body of research and range of interventions that are now available will help to ensure that when organisations do invest scarce resources in training their employees, there is a much greater likelihood that that the transfer of this training will successful.

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Table 1. Summary of the pre-, within-, and post-training goals and strategies.

Pre-training Goals & Strategies

Goals:
1. Improve trainees' motivation to learn,
2. Improve trainees' pre-training self-efficacy/ knowledge, and
3. Demonstrate organizational support for training.

Strategies:
1. Use of goal setting,
2. Allow trainees to participate in decision-making,
3. Provide information concerning the purpose and intended outcomes of training,
4. Reduce any perceived threat to the trainee,
5. Help the trainee to develop better learning strategies,
6. Develop a plan for how the trainee will utilise their training,
7. Identify external factors that may restrict the trainee's ability to utilise their training, and
8. Assist the trainee to identify organisationally valuable outcomes from training.

Within-training Goals & Strategies

Goals:
1. Improve trainees' understanding and adaptive expertise,
2. Improve trainees' intentions to transfer, and
3. Improve trainees' reactions to training.

Strategies:
1. Use procedures in training are similar to those used in the work place,
2. Use real-life problems that the trainee is familiar with,
3. Provide different examples during training and highlight the important features of each example,
4. Assist trainees to develop detailed, well-integrated knowledge structures, and self-regulatory skills such as planning, monitoring, and evaluation,
5. Set short-term goals for the immediate transfer of their training,
6. Set longer-term goals that focus on the mastery of the training,
7. Assist trainees to develop and commit to specific implementation plans,
8. Use Relapse Prevention as a tool to identify specific situations where they may be at risk of failing to utilise their training, and
9. Create a positive training climate.

Post-training Goals & Strategies

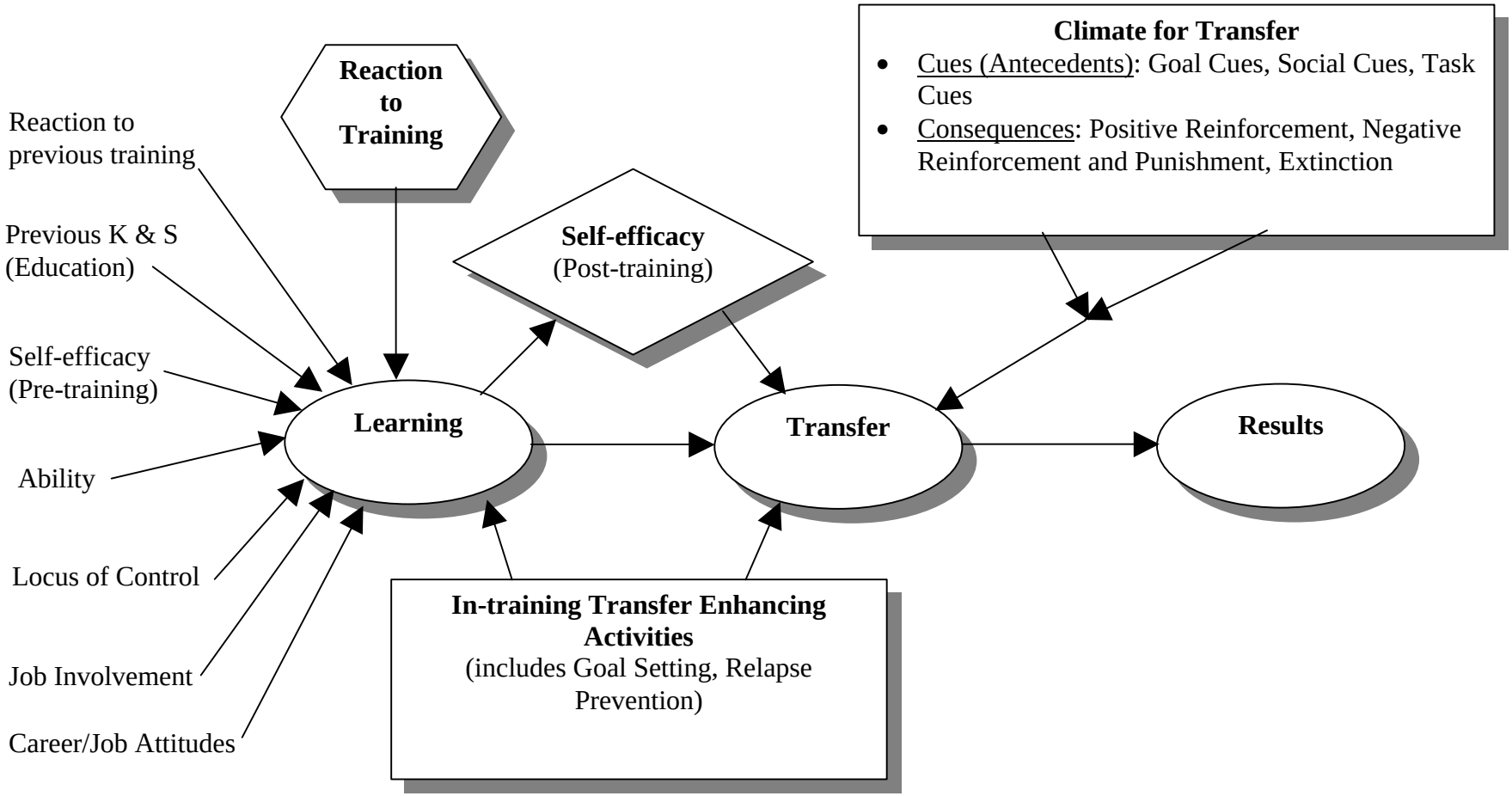
Goals:
1. Improve the climate for the transfer of training, and
2. Improve the vertical transfer of training.

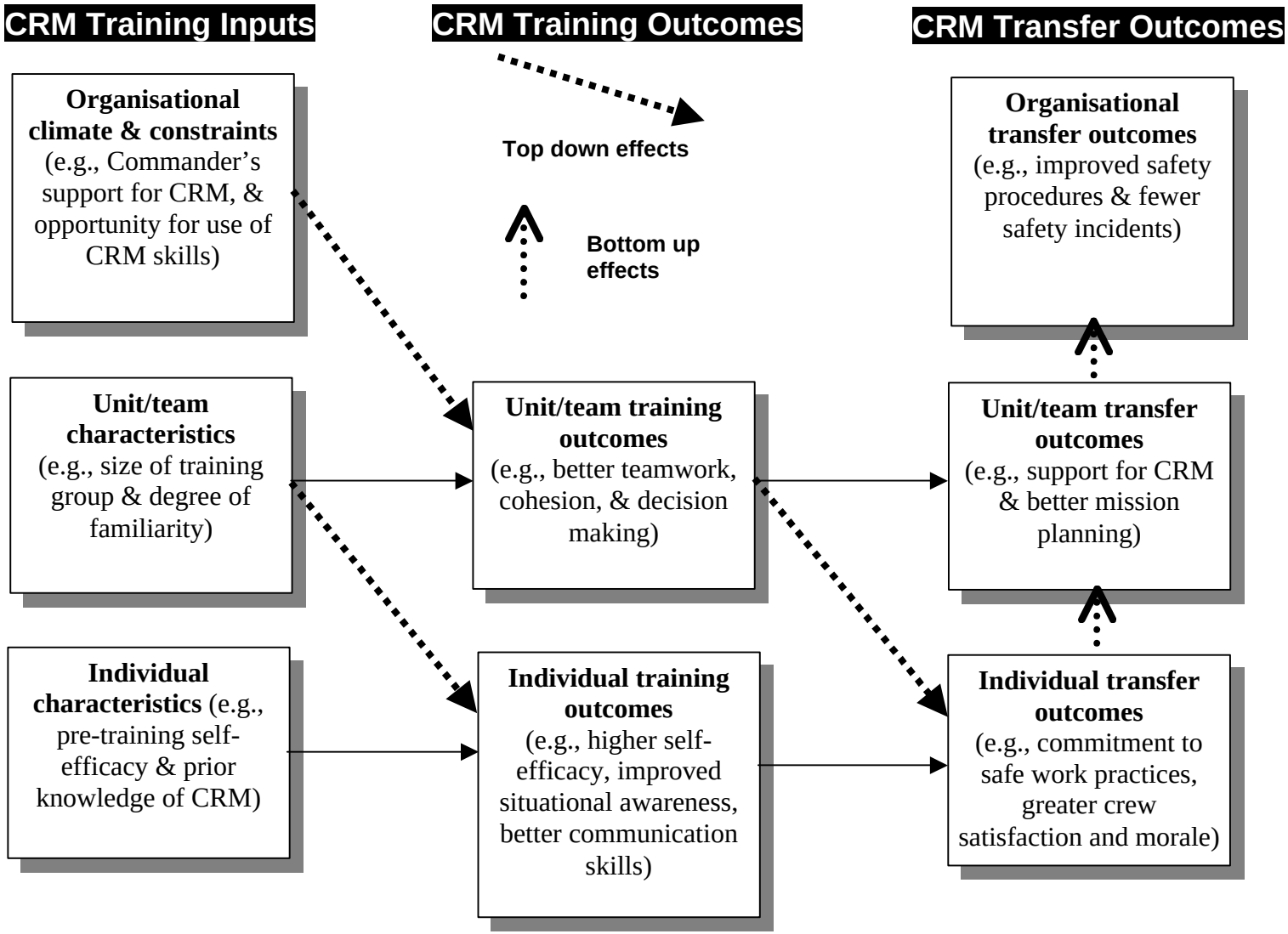
Strategies:
1. Provide trainees with specific goals for improved performance resulting from transfer of training,
2. Ensure supervisors and co-workers are supportive of the trainees' attempts to transfer their training,
3. Ensure trainees have access to equipment or resources that are essential to the transfer of their training,
4. Positively reinforce better performance,
5. Reduce barriers such as lack of time or opportunity to perform the tasks trainees learned during their training,
6. Train all members of a work unit at the same time,
7. Monitor post-training performance, and
8. Align training with organisational goals and directions.

Figure Captions

Figure 1. Transfer Training Model from Thayer and Teachout (1995).

Figure 2. Multilevel model of training inputs and CRM training and transfer outcomes (based on Brown, Weissbein & Kozlowski, 1998).


Reaction to previous training
Previous K & S (Education)
Self-efficacy (Pre-training)
Ability
Locus of Control
Job Involvement
Career/Job Attitudes
Reaction to Training
Self-efficacy (Post-training)
Climate for Transfer
Cues (Antecedents): Goal Cues, Social Cues, Task Cues
Consequences: Positive Reinforcement, Negative Reinforcement and Punishment, Extinction
Learning
Transfer
Results
In-training Transfer Enhancing Activities (includes Goal Setting, Relapse Prevention)


CRM Training Inputs
CRM Training Outcomes
CRM Transfer Outcomes
Organisational climate & constraints (e.g., Commander's support for CRM, & opportunity for use of CRM skills)
Top down effects
Bottom up effects
Organisational transfer outcomes (e.g., improved safety procedures & fewer safety incidents)
Unit/team characteristics (e.g., size of training group & degree of familiarity)
Unit/team training outcomes (e.g., better teamwork, cohesion, & decision making)
Unit/team transfer outcomes (e.g., support for CRM & better mission planning)
Individual characteristics (e.g., pre-training self-efficacy & prior knowledge of CRM)
Individual training outcomes (e.g., higher self-efficacy, improved situational awareness, better communication skills)
Individual transfer outcomes (e.g., commitment to safe work practices, greater crew satisfaction and morale)