



*A Practitioner
Guide to*

**Transfer of
Learning and
Training**

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Intergovernmental Studies Program Primer

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The purpose of this primer is to provide a brief introduction to the topic of learning or training transfer. Organizations spend significant amounts of capital on training, with estimates ranging from \$40 to \$200 billion annually.⁽¹⁾ The impact of training is a vital matter for organizations because performance may be enhanced to the extent training programs can build capacity. However, it is estimated that as little as 10 to 20 percent of the knowledge or skills taught in training programs are effectively transferred to the workplace. Many reasons have been suggested as to why so little training is actually transferred to application on the job, including inappropriate instruction techniques and learner characteristics, such as motivation or years of experience. More recently, however, the challenge of transfer has been described as an evolutionary challenge or lag—we simply expect too much information processing capacity from our brains, which were not designed to meet the demands of the *information age*. From this perspective, the study of transfer of learning is a game of evolutionary catch-up for individuals. For organizations, an explicit focus on the transfer of learning is a missing component of the building of a learning organization.⁽²⁾

The word transfer comes from two Latin terms, *trans* (over or across) and *ferre* (carry). Educational experts and psychologists have defined transfer of learning in a number of similar but subtly different ways:

- (1) “The degree to which a behavior will be repeated in a new situation,”⁽³⁾
- (2) “the broad, productive and supported use of acquired knowledge, skills, and motivations in new contexts and learning tasks,”⁽⁴⁾
- (3) and “the degree to which trainees effectively and continuously apply what is learned in a training setting to a work setting.”⁽⁵⁾

What is common to all the definitions is a focus on the application of knowledge or skills acquired in one setting to another context.

The literature on the transfer of learning has identified many different types of transfer. Awareness of the types of transfer can help organizations decide what transfer goals they are trying to attain and design training accordingly. The following list and definitions is a snapshot of several of the most common types of learning transfer discussed in studies.

Definitions of Learning Transfer

Types of Learning Transfer

Near vs. Far Transfer

Near transfer is the application of learned behavior, content knowledge, concepts, or skills in a situation that is very similar to the original circumstance. An example of near transfer would be learning to measure the area of a triangle and applying the same method to measurement of the area of a rectangle. *Far transfer* is the application of learned behavior, content knowledge, concepts, or skills in a situation that is dissimilar to the original learning context. Instances of far transfer have been exceedingly difficult to observe in studies. Near transfer is definitely the most popular training objective. It is also more likely to be effective than far transfer. The distinction between near and far transfer is not dichotomous, it is only a matter of distance.

Low Road vs. High Road Transfer

Low road transfer is learning or training that imparts the capacity for **automatic**, or **unconscious**, awareness of the similarity of surface features between two situations. An example is learning to drive a car that is different from the vehicle a person already drives. The awareness results from the similarity of the surface features of the two vehicles and the unchanging context of the road. *High road transfer* is learning or training that builds the capacity for **conscious**, **deliberate**, or **mindful** consideration of the similarity of structural features between distantly related original and novel situations and the subsequent application of an existing skill. An example is the application of the rules or concepts of chess to war, such as “surround and capture,” where the surface features are quite different but structural features are similar.

Negative vs. Positive Transfer

Trainers must be careful to avoid *negative transfer*, which occurs when an assessment of similarity made between two situations is erroneous, especially since such connections may be difficult to unlearn once established. *Positive transfer* is when a correct assessment of similarity is made between two situations. One type may be as prevalent as the other, rendering extra caution necessary to avoid the negative form.

Lateral vs. Vertical Transfer

Skills learned in one setting can be applied “as is” to similar situations or used as a foundational precursor to build higher order skills. *Lateral transfer* is when prior learning is transferred within the same order in a knowledge hierarchy. For example, when the skill of driving a car is applied to riding an off-road, all terrain vehicle. *Vertical transfer* is when prior learning is transferred upward in a knowledge hierarchy. For example, students of mathematics need to apply knowledge of multiplication to solve calculus equations.

Content vs. Skill Transfer

Learning could focus on teaching skills or acquisition of content knowledge. Each can inform the other. *Content-to-skill transfer* occurs when learning in a subject area transfers to an applied skill. A *skill-to-content transfer* occurs when knowledge of a skill transfers to improved understanding of a subject. A *skill-to-skill transfer* occurs when knowledge of one skill transfers to the performance of another skill. *Content-to-content transfer* occurs when learning in a subject area transfers to another subject area. There is no strict one-to-one relationship requiring skill based learning be used to teach skills—content learning can be used to inform skills and vice versa.

Over a long period of time—literally thousands of years—many different models of training have been tried. It is only within the last hundred years that formal studies with rigorous methodologies have been employed to attempt to determine which model, if any, provides the most return for the investment of time, energy, and money spent on learning and training. Different models may be more or less appropriate given the transfer objective.

Models of Learning Transfer

Formal Discipline Model

The classical approach is known as the *formal discipline model*. Used in ancient and medieval times until the twentieth century, it held that learning certain subject areas, such as logic or Latin, exercised and trained the mind, thus enabling an individual to acquire skills that could be applied to other subjects or general problem solving. The first education researchers in the early twentieth century failed to find support for the formal discipline model.

Identical Elements and General Principles Models

Based on evidence from experimentation, education researcher Edward Thorndike developed an alternative model called *identical elements*. Its claim is that designing training situations or using examples that are as closely related as possible to the end context best encourages transfer. The objective of this model is near transfer. Thorndike was soon challenged by research performed by Charles Judd who developed the *general principles model*. His research supported the idea that learning general principles enabled individuals to understand new and dissimilar situations.

Cognitive Model

More recently psychologists have entered the debate and emphasized learning and transfer in terms of how the brain processes and organizes

information for applied use, a *cognitive model*. This model reduces the focus of training on instructional techniques and instead concentrates on understanding schema, or mental models as central to improving the rate of transfer of learning.⁽⁶⁾

Conditions of Learning Transfer

Although transfer of learning is difficult, it is possible to create conditions that promote rather than inhibit or stall transfer. Several factors are of primary importance.⁽⁷⁾

1. Learners should be encouraged to acquire a deep understanding of primary knowledge areas relevant to the transfer goals.
2. Learners or trainees should specifically be taught about the concept of transfer of learning or training and the skills that facilitate its achievement.
3. Learners must attain a threshold level of motivation to perform the mental processes that enable transfer. Motivation can occur in individuals intrinsically or be nurtured through training. The latter can be nurtured through a process of *orienting*, “a cognitive self-regulation activity” involving “preparing oneself to learn and solve problems.” Additionally, for learners to be motivated they must find meaning in the training. Building meaning in a training context is usually accomplished by linking the learning as closely as possible to the real work situations learners will face. Research reveals the perceived importance of the training also affects meaning. Learners must believe the training is relevant and beneficial to the tasks they perform, or roles they play, at work.
4. Learners can increase their capacity for transfer by explicitly developing encoding skills, whereby they facilitate storage and retrieval of information by linking it to existing schema. This condition takes into account how our brains operate, process, and store information.
5. Transfer within an organization may facilitate individual and organizational transfer. This condition highlights the social aspects of learning.
6. Learners increase the extent of transfer through practice and repetition.
7. The likelihood of transfer is increased if learners are exposed to individuals, through observation or reading, who demonstrate a mastery of transfer.
8. Training for different types of positions may require different types of transfer and instructional strategies. Some positions are more autonomous than others. Less autonomous positions likely intend the achievement of low road transfer; more autonomous positions are likely to attempt high road transfer.

Challenges of Learning Transfer

Scholars who study the effectiveness of the transfer of learning and training agree that transfer is difficult and that when it occurs it is usually near transfer rather than far transfer that is achieved. This is the wisdom gleaned from several hundred studies. A review of research on transfer in work environments reveals the same challenge: Only a fraction of formal training is ultimately transferred and applied in the work environment.⁽⁸⁾ We have touched on some of the challenges of formal training already: instructional technology, motivation, information encoding and retrieval, and perceived training relevancy.

Clearly, people learn continuously and grasp exceedingly complex concepts. The challenge is transference beyond the domain in which skills or content knowledge was originally learned. Several factors facilitate such transference.

The objectives of organizational training—transfer expectations—should be formulated and made explicit. Experts suggest that learners expected to acquire task skills should be taught exactly what they will be expected to perform in a context as similar as possible to that of the application. They may enhance their probability of success by quick and repeated application of knowledge and skills in the work setting after training.⁽⁹⁾ Evaluation and feedback provided to learners are important for assessing and increasing the extent of transfer.

The use of multiple examples facilitates the transfer of concepts by stimulating the learner's mind to think about the application of a concept in different, concrete contexts. Familiarity with multiple examples can even be more important than working through a problem. The goal of using multiple examples is to develop the process of analogical reasoning, where the brain makes connections of similarity between two things. Whereas working through a problem might encourage transfer, analogical reasoning itself is a form of transfer—"this is like that." Analogues always contain similarities and dissimilarities. Learners benefit from learning to distinguish among the surface and structural features of analogies.⁽¹⁰⁾

Research suggests that the characteristics of trainees or learners may be as much as, or even more significant than, the design of the training program or instructional methodology.⁽¹¹⁾ Organizations can build a composite of individuals who learn well by correlating trainee characteristic data with learning outcomes assessed through formal evaluation. One such characteristic—the quantity of possessed knowledge—is

Overcoming Learning Transfer Challenges

an indicator of how much learning an individual is capable. Organizations can thus select individuals who might flourish more than others, or transfer more than others, in a training program.

Supervisory support is important in the workplace to effect the transfer of learning and training, and is one component of building a culture of transfer. Studies reveal a chief obstacle in the workplace to such transference is the presence of unsupportive supervisors, whether because they have different priorities or because they are skeptical of the value the training will provide. For supervisors to be fully supportive they must be aware of the training program and the connection between the knowledge/skills acquired and intended outcomes.(12)

Transfer is more likely to occur and be available for use when the material or skills contains some personal meaning. Instructional contexts should therefore be designed to incorporate examples, case studies, or skills that closely reflect the context or behaviors that trainers ultimately intend to transfer to learners.(13)

Table 1
Supporting
Transfer of Learning

Support Method	Implementing Agent
Establish Explicit Objectives	Organization
Repetition of Learning	Individual
Evaluation and Feedback	Organization
Use of Multiple Examples	Trainer
Trainee Selection	Organization
Supervisory Support	Organization
Cultivation of Meaning in Material	Trainer/Individual

For an organization in which the staff performs a broad spectrum of job-related activities—ranging from routine, or fixed, task-based work that is procedurally grounded to general problem solving that may be open ended. Staff roles also differ in their extent of autonomy. Training approaches should be selected and instructional technology should be designed with an explicit awareness of the work related activities to be performed and the level of autonomy provided to targeted personnel cohorts. For example, near transfer approaches would be preferred for task-based work, while far transfer approaches would be preferred for general problem solving.

		Supervision	
		Low	High
Task Flexibility	High	Near High Road ¹	Near Low Road ²
	Low	Far High Road	Far High Road ³

*Table 2
Transfer Objective
in Variable Conditions
of Task Flexibility
and Supervision*

Key (14)

- (1) High road transfer may be the preferred approach under low supervision conditions because workers need to be able to think about the task if something out of the ordinary arises.
- (2) Low road transfer may be the preferred approach under high supervision conditions because supervisors are nearby if something out of the ordinary arises, relieving workers from needing to resolve a problem.
- (3) High Road transfer may be the preferred approach under high task flexibility conditions because the performance of adaptable tasks requires mindfulness and contemplation.

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