The Transfer of Learning

**Introduction**

Transfer of learning is one of the most commonly applied principles in sports, education, and rehabilitation. The transfer principle gives practitioners a basis for developing curricula and instructional methods, as well as protocols used in clinical settings.

Transfer of learning is defined as *the influence of previous experiences on learning new skills or performing skills in new contexts*. Transfer effects may be positive, negative, or zero when there is no influence at all. The goal for sport coaches is to select practice activities and use instructional techniques that optimize positive transfer to the competitive arena.

First, we’ll talk about why the transfer principle is important to practitioners. Then we’ll go over the different types of transfer and why each occurs. Finally, we’ll apply the transfer principle to coaching strategies.

Upon completion of this module, you will be able to:

- Describe the transfer of learning principle,
- Explain why the transfer principle is important in coaching, teaching, and rehabilitation,
- Identify the types of transfer and give examples of each, and
- Develop coaching strategies based on positive transfer effects.
Why Transfer is Important

Sequencing Skills

Just as with cognitive skills, motor learning requires that each new concept builds on the preceding one in a simple-to-complex sequence. Learners should master basic skills before tackling more complex skills. If the instructor does not progress skills effectively, time is wasted going back to learn prerequisite skills.

Instructional Methods

A second practical application of the transfer principle concerns instructional methods. For example, a track coach may have athletes perform part of a skill before practicing the entire skill, such as a standing throw or a shortened approach to a jump. Learning component parts of skills will help the athlete integrate key movements into the whole skill.

Assessing the Practice Conditions

When a coach designs a practice session, he or she should be able to identify the activities and conditions that lead to the best results. The effectiveness of any practice condition should be determined only on the basis of how the practiced skill is performed in a “test” context. The coach should assess the value of practice drills and exercises through testing or in a competitive condition.

Types of Transfer

Positive Transfer

Positive transfer means that practice on one activity results in improvements on another activity. Two hypotheses have been
proposed as to why positive transfer occurs. And both have merit.

First, the *identical elements theory* proposes that positive transfer increases as a function of the similarities of the components of motor skills and the context in which they are performed.

Second, the *transfer-appropriate processing theory* states that the amount of positive transfer is related to the similarity of the cognitive processing activity involved in the two situations.

For example, an experienced discus thrower usually learns the rotational shot put quickly because of the similarities both in movement qualities and mental processing.

**Negative Transfer**

Negative transfer means that practice on one activity interferes with the performance of another activity. Negative transfer occurs when two skills are performed in a similar environmental context, but the movement characteristics are different. Two situations that are especially vulnerable to negative transfer effects involve a change in spatial locations and/or the timing of a movement.

Think of the difference between batting a baseball vs. batting a softball. While swinging the bat has similar qualities for both sports, a baseball pitcher throws the ball downward in an over arm motion.

In contrast, a softball is thrown underarm and rises as it approaches the plate. In this example, previous experience in baseball could interfere with hitting a softball due to changes in path and location (the spatial characteristics) of the ball, as well as the timing of the swing.
Fortunately, negative transfer appears to be rare and temporary in motor skill learning. Beginners experience negative transfer because they are initially confused by subtle changes to a familiar skill. As a coach, you may have to encourage athletes who are experiencing temporary negative transfer effects so that they do not become discouraged early in learning a new skill.

**Zero and Bilateral Transfer**

A third type of transfer is zero transfer. This occurs when previous experience has no influence on the performance of a new skill or change in context of an existing skill. For example, previous swimming experience should not influence learning to snow ski.

When transfer of learning concerns the same skill performed with different limbs, it is called bilateral transfer. Bilateral transfer occurs because the learner already understands what is required to achieve the goal of the skill. Another explanation is that a generalized motor program can be applied to performance on the unpracticed limb.

**Coaching Strategies for Positive Transfer**

**Analyze the Skill and Know the Learner**

A first step in deciding how to maximize positive transfer is to be sure that you understand the fundamental movement patterns and demands of important skills in your sport. In addition to positioning and timing (the spatial and temporal elements), understanding concepts, perceptual qualities, and strategies are key to optimizing positive transfer.

**Become familiar with the learner’s past experience** and capabilities so that you can capitalize on similarities between new
skills and skills that he or she has already mastered. Knowing that your new high jumper is a skilled basketball player, for example, you can relate similar elements in the last three steps of the lay up shot to the approach and take-off in the high jump.

Make sure that the athlete’s existing skills that you intend to transfer are **well learned and correct**. The athlete can readily transfer movement qualities from existing skills to new skills when existing skill are automatic. However, errors also transfer to new skills, so it is important to prevent poor movement patterns that could transfer from learned to new skills.

**Develop Proper Sequencing**

The athlete must learn simpler foundational movements before building to more complex skills. Intratask transfer is a term applied to practicing parts of a skill that contribute to learning and performing a whole skill.

For example, to learn to perform the clean or snatch, Olympic weightlifters practice pulling exercises from the floor as part of the learning sequence for the competitive lifts.

We can also capitalize on transferring the learning factor in strength to similar components of gross motor movements in sport skills. For example, medicine balls provide a versatile way to develop strength in specific ranges that simulate sport movements, such as throwing or batting. In addition to building strength, the athlete can develop basic gross motor movements inherent in sport skills, such as leading with lower body, transferring the body weight from the back to front leg, or blocking forward momentum. An added benefit is that the athlete can focus on the correct movement without regard to outcomes of executing the whole sport skill.
Match Competitive Specificity

*The Specificity of Practice Principle* states that to achieve optimal performance, a learner should experience practice conditions that match test or competitive conditions as closely as possible.

The following strategies can help maximize similarities between practice and performance.

- Match practice with sensory and perceptual characteristics. For example, practice technique in a mirror for visual feedback, but also practice without the mirror to match competitive conditions.

- Match practice with the performance context. For example, prepare for a night football game at night—the same environment as the game.

- Match practice with competitive experiences. Include practice that simulates the types of physical, mental, and emotional conditions the athlete may experience. For example, a coach may have the team shoot free throws at the end of practice to simulate the athlete’s level of fatigue late in a game. Or, the coach may create conditions that require the athlete to control anxiety levels when playing under pressure.

Use Bilateral Transfer

- When skills are performed with either limb, gain proficiency with the preferred limb first, then practice with the second limb. Then alternate practice for both limbs using sets of blocks of trials or time with each limb.
• While rehabilitating from an injury to one limb, practice skills using the uninjured limb.

**Sources**


