

# Skill Learning and Skilled Performance

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Perhaps the primary role of the coach is to help players to improve their skill level. To do this effectively requires an understanding of how players learn, how skilled movements are performed and how coaching sessions should be structured and organised to maximise skill acquisition. This article provides an introduction to this area by:

i) distinguishing between key terms such as skill, technique, learning and performance; and ii) highlighting how skill learning can be measured and evaluated.

## Skill, Technique, Learning and Performance

The term skill refers to a player's ability to select, organise and execute actions, appropriate to a given situation in an effective, consistent and efficient way. Skill is not the same as technique which refers to a basic action or movement pattern. Skill is the ability to use techniques appropriately and effectively at the right moment, and in the correct situation. Techniques form the building blocks upon which skill is developed. It is therefore essential that the coaching process shows the learner how and when to apply techniques.

Figure 1.

A performance curve showing increases in performance on a football skills test for shooting. The shape of the curve indicates a rapid improvement in performance at first followed by a general levelling off during which improvements are relatively slow. This general form of performance curves (i.e., steep at first and more gradual later) is one of the most fundamental laws of practice. The results of a retention test to assess learning are highlighted on the right-hand side.

The key features of skill are that it is:

- goal oriented (players know what they are attempting to do)
- effective and reliable (the goal is achieved with maximum certainty and consistency)
- efficient (it uses no more effort than necessary)
- learned (developed with practice and experience)

Learning is the process that underlies the acquisition and retention of skilled actions. It is defined as a set of processes associated with practice or experience which leads to a relatively permanent change in the capability for skilled performance. Performance simply refers to behaviour that can be observed. Learning is not directly observable, since it involves changes in central nervous system function, but it can be inferred by observing changes in performance over an extended period of time. Learning can only be deemed to have taken place if the improvement in performance is relatively

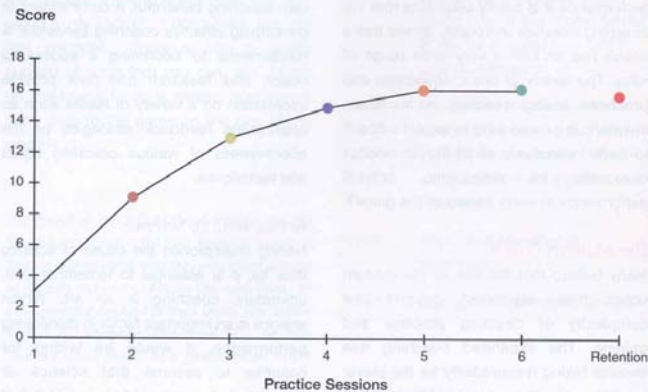
permanent in nature. Temporary performance variations generally occur for other reasons, such as changes in motivation, anxiety or fitness levels (i.e., fatigue) and consequently, are not truly representative of skill learning.

The key features of skill learning are that it:

- results from extended periods of practice or experience
- is not directly observable, but is inferred from changes in performance
- produces an acquired capability for skilled performance
- is relatively permanent and not temporary in nature

## Measurement of Skill Learning

The coach needs to know whether learning is taking place and this will involve not only structuring practice sessions properly, but also monitoring and evaluating progress in some way. Evaluation might be through direct observation during training and/or competition or through more objective means such as football skills tests, computerised player analysis or videotaping the learner during performance.



One way to evaluate learning is to plot performance improvement over time (ie, practice trials). For this approach an agreed measure of learning is required, such as performance on a shooting skills test (see Figure 1).

As a general rule, therefore, the visible evidence of performance tells the coach whether or not learning has occurred. However, coaches should make this type of inference very cautiously since there may be some variables that affect performance, but don't affect learning. Consider, for example, the player who has a personal problem that interferes with his performance at a particular practice. Other variables that may affect performance, whilst not necessarily affecting learning are motivation, anxiety, fatigue and injury. The more coaches understand about such variables, then the more likely they are to make correct inferences about the learning process.

To measure learning accurately, retention or transfer tests must be used in association with performance curves. A retention test is when the player is re-tested after a rest period when the transient effects of performance have subsided. Alternatively,

a transfer test requires the learner either to perform the skill that has been practised in a new situation or to perform a new variation of the practised skill (eg, passing over a different distance).

It is crucial for the coach to know that several instructional variables and the organisation and scheduling of practice also affect practice and learning differently. For example, low frequency of feedback, massed practice scheduling, variability of practice and high contextual interference learning conditions (ie, practising more than one skill in a session) have been shown to affect performance negatively (as indicated by performance curves), whilst having no detrimental effect on skill learning (as indicated by retention or transfer tests). Perhaps more importantly, high frequency of feedback, distributed practice scheduling, specificity of practice and low contextual interference learning conditions (ie, practising only one skill per session) have positive effects on performance, whilst seemingly being detrimental to the skill learning process. These important issues relating to the structure and organisation of practice sessions will be discussed in greater detail in future articles.

but in the meantime the important point for the coach is that there is a distinction between learning and performance and that consequently, caution needs to be exercised in exacting too much from performance indicators. 'What you see is not always what you get'. Therefore, when assessing skill, it is advisable to watch a player on several occasions and under different playing conditions. Coaches may also need to consider getting a second opinion on a player.

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#### Further Reading

Schmidt, R.A. (1991) *Motor Learning and Performance*. Champaign, Illinois: Human Kinetics.

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