

# Structuring Practice for Effective Skill Learning

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This article considers how to structure practice for effective learning. The organisation of the practice session is considered, highlighting how two or more skills can be practised together and how systematically varying practice can facilitate the learning and retention of football skills.

## Variability of Practice: Enhancing Learning of a Single Class of Skills

Consider a situation where only a single skill is to be learned, such as passing with the instep. How should the coach structure the practice session for effective learning? One approach would be to have players repeatedly pass the ball back and forth over a consistent distance (i.e. specific practice), whilst another would be to alter continually the demands of the task by requiring players to pass over varying distances, angles and speeds (i.e. variable practice). Which approach is most effective? [Coaches should note the distinction between **specific practice** of a skill as discussed here and **specificity of practice**. Specificity of practice relates to the fact that practice should eventually mirror the 'real' situation as closely as possible (i.e. match-play). Consequently, specificity of practice should increase as coaches begin to implement more variable practice conditions.]

Research indicates that when learning skills variable practice results in greater accuracy and consistency than specific repetition of the same skill. This finding is more marked with children than adults. If skill learning is concerned with the acquisition of motor programmes or 'rules' which are applicable across the range of possibilities encountered during match play (see *Insight*, Vol. 1, Issue 2) then the richer and more diverse the practice the more effective it should be in facilitating this process. Coaches should ensure that they vary practice by manipulating factors such as distance, speed or direction of pass and that the practice session mimics the range of variations experienced during a match. However, coaches should not make the variation in practice so great that the task becomes a different skill to that originally practised. For example, with regard to the earlier example of instep passing, coaches should ensure that however they vary conditions it is still the same skill or motor program that is being practised (i.e. instep pass).

## Practising Several Skills: The Contextual Interference Phenomenon

Closely related to variability of practice is the research on contextual interference. High contextual interference conditions relate to the situation where several skills are practised within the same practice session, whilst low contextual interference occurs when only one skill is practised. For example, practising three different football skills in combination with one another within a one hour coaching session would be an example of a high contextual interference environment, while only practising single skills within the same time period would involve low contextual interference conditions (see Table 1). Which practice schedule best facilitates skill learning?

Research indicates that practice involving high contextual interference is better for skill learning than low contextual interference. Moreover, random high contextual interference conditions produce better learning than blocked high contextual interference conditions (see legend for Table 1). It is not essential that the skills presented in a random high contextual interference session be similar to each other. The benefits of random practice are enhanced when skills differ more markedly (e.g. passing and heading may be more distinct than passing

and shooting). The suggestion is that practising more than one skill in a random fashion during a session constrains the learner into deeper' conceptual processing of relevant information. Learning is facilitated because the performer has to make a different movement on consecutive trials, requiring the selection of a different motor programme or 'rule' on each occasion. Selecting a different action every trial, as opposed to simple repetitions of the same skill, forces the learner to perform additional cognitive operations which result in more meaningful storage of information in memory.

## Some Important Considerations

Although there is strong evidence in favour of variability of practice and high contextual interference practice conditions, coaches must be aware of several important issues:

1. Early learning should be marked by stability so that the learner understands the basic characteristics of the skill. The suggestion is that the learner should have an adequate 'image of the act' before embarking on variable and/or high contextual interference practice conditions. It may be better to introduce variability and/or contextual interference into practice only after the learner has a general idea of the

Table 1 Practice Sessions (60 minutes duration)			
Type of Practice	Monday	Wednesday	Friday
LCI	Passing	Shooting	Dribbling
HCI	Passing	Shooting	Dribbling
(blocked or	Shooting	Dribbling	Passing
random)	Dribbling	Passing	Shooting

Table 1. Examples of low (LCI) and high (HCI) contextual interference practice schedules. LCI involves practising a different skill on the three separate days (i.e. 60-minute session on each skill). HCI blocked involves practising one skill for 20 minutes per session before moving on to the second, then finally the third skill. HCI random requires the learner to practice the three skills in a totally random or non-blocked manner. In the most randomised case, the learner never practices the same skill on two consecutive trials.

skill. That is, variability and contextual interference may be best introduced during the late Cognitive or early Associative stages of learning (see *Insight*, Vol. 1. Issue 2). Also, it may be better to introduce blocked contextual interference conditions initially before gradually making this scheduling more random as skill develops.

2. Variable practice and high contextual interference conditions may be combined as learning progresses (i.e. players become more skilled). Coaches should be aware that drills typically involve low variability and low contextual interference and may be ineffective beyond the beginner stage, whilst small-sided games or match play provide positive opportunities for random high contextual interference and variable practice.
3. Although variable practice and high contextual interference conditions should result in more effective skill acquisition and retention in the long term, initial levels of performance may be degraded below levels observed when employing specific practice and low contextual interference scheduling (see *Insight* Vol 1. Issue 1 for distinction between performance and learning). This should not be a major concern since the objective should be to stimulate long term learning rather than short term changes in performance. The ability to understand that better performance levels may be delayed is a critical skill for coaches using variable and high contextual interface conditions. Coaches need to be patient since this approach will be more productive in the long term.

### Conclusions

- Variable practice increases the generalisability of skill and is an important parameter in motor learning
- Random practice involving several different skills (i.e. high contextual interference conditions) is better for learning than blocked practice of one skill
- Variable and random practice can be combined to ensure optimum learning
- Positive effects may be slightly delayed, so coaches need to be patient.

### Further Reading

Schmidt, R.A. (1991) *Motor learning and performance: From principles to practice*. Human Kinetics: Champaign, IL.

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