



BIOMECHANICS OF FOOTBALL

Biomechanical techniques can be used in any sport. Football has more than most. However, many coaches focus on the most widely used techniques and terms to describe certain techniques.

Enhancing your knowledge and breaking down the technique is important in player learning.

Kicking the ball is the most widely analyzed study in football. Although there are many variations of this skill due to ball speed, position, nature and intent, the method of using the instep is said to give the maximum force of kicking a stationary ball. In contrast, other skills in football have been paid less attention, although they are just as important.

Because of the nature of the game, many coaches try to simplify the technical aspects of the game and 'instruct' certain methods and phrases when coaching.

'Use your laces' – probably the worst phrase when teaching young people how to strike a ball. If David Beckham had followed the rulebook on how to strike a ball, he certainly wouldn't have developed the quality he did.

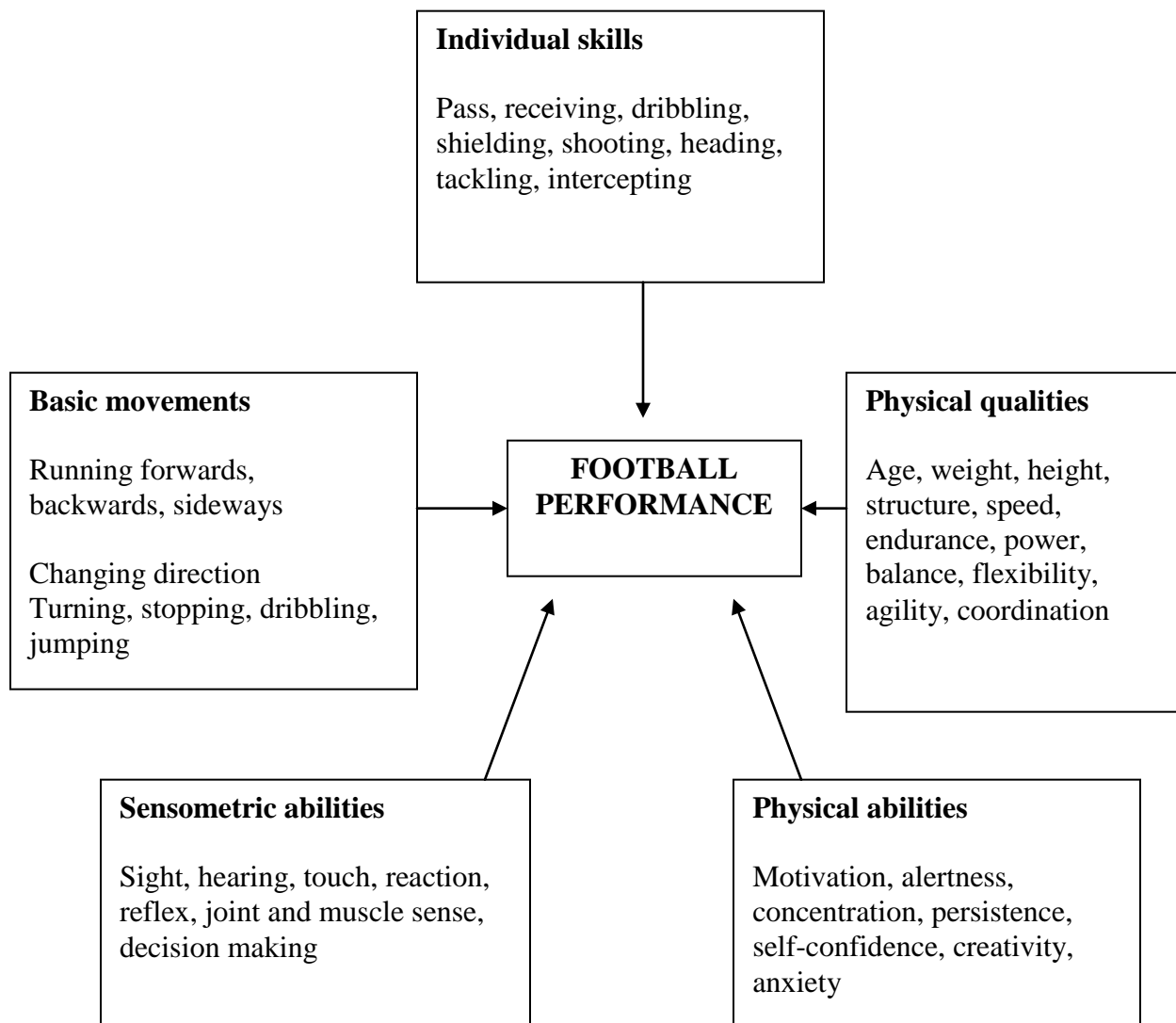
'You must always pass the ball with the inside of the foot' – again this is purely limiting players and the range of skills they can try for themselves.

There are so many factors that the individual has to think about when performing a skill. They will have the equipment/ clothing they are wearing. This will differ from player to player. Also, some players may have had problems in the past with certain techniques and like to perform them differently to improve confidence.

Many aspects affect skill performance, which is why the coach should let the player experiment at a young age, make lots of mistakes and express themselves to develop a self-learning process as each player performs differently with different movement patterns to others.

Coaching a range of technical skills at a young age is important for overall development of the long term player.

The following diagram explains the components of football skill:



There is no form of individual skill which is universally valid for everybody. There are however certain things a coach can follow:

- Try and perceive each players own individual technical qualities and develop them further
- Technically gifted players will learn new skills quicker than less talented players
- Coaches should ensure that all the above components are included in a session for maximum benefit. For example you could have players dribbling, at high speed, performing various turns and stops to work on the range of skill development.

CONTROL OF SKILLFUL MOVEMENT

The movements in football are monitored by players internally. Sense organs and muscles/ tendons provide the information to the central nervous system about their movements. Modifications through self learning occur to change any movement as and when required.

Players are the only people that know what their own movement pattern is going to be. This is why the fastest, most skilful player is harder to play against due to having less time to react to their movement.

Internal feedback:

1. internal loop – the nerve endings in the skin tell the footballer about touch of the ball
2. kinesthetic receptors in joints control the joint angle
3. muscle spindles relate to the length change in the muscle
4. the golgi apparatus the tension in the tendon

The quality of the internal feedback mechanism is hereditary. The best players are the ones with the most effective internal feedback systems. This again, points heavily in the favour of coaches letting the player self learn and experiment.

Following research into player movement values in training and games, it was concluded that over a season player performed an average of 96 sprints from 1.5-105m. Average time for low intensity work was 51.6 seconds and for high intensity work, 3.7 seconds. The matches included tackles (51.4), turn (49.9) and jumps (9.4). The number of maximal performances and executions is low on the average for a player in a whole match.

At top level, 900-1000 actions will be performed with the ball, 350 passes with one touch, 150 with two touches and the rest with several touches and dribbling. The top teams need on average 16-30 attacks and 7-10 shots on goal to score one goal.

With all these various actions, the internal feedback system is constantly sending information back to the central processing system and 'teaching' the player whether they need to perform the skills differently, to keep using the successful techniques or to change due to a change in the situation they face in a game.

Top level footballers can produce skills in the following:

Skill = force x velocity x accuracy x purposefulness

In other words, the best players can perform skills at high speed, with great accuracy at high levels of power and pace with a positive outcome.