

Applying MOTOR LEARNING PRINCIPLES

in Coaching Volleyball

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Coaching volleyball is enhanced when coaches draw from a variety of disciplines to assist in teaching skill development. The discipline of motor learning focuses on the acquisition of motor skills and/or the improvement of motor skills, and involves principles that can be implemented by coaches to aid in volleyball skill acquisition. Coaches using principles from motor learning literature will enable players to reach their full potential in learning and developing volleyball skills leading to more effective performance on the court. The following is a two-part series, summarizing various principles from motor learning research and making applications for coaching the sport of volleyball.

PRINCIPLE #1

The Practice Conditions Should Be Like the Game

It has been stated that if you want to learn how to play the game, then play the game. In motor learning this is a memory principle called the "encoding specificity principle" which suggests that the more closely aligned the practice context is to the game context, the better the game performance. For volleyball coaches this means striving to make the practice conditions as much like the game conditions as possible. For example, if you know you will be playing in a gym with a very low ceiling, practice passing balls at a lower level. If you are going to face a big middle hitter who cuts the angles in

your next match, then have someone hitting those angles in practice. If you want your players to perform well during stressful games, set up similar pressure situations during practice. For example, playing loud music, making bad calls, or putting the server on the end-line to serve for game point after a long rally, are all examples of making practice more like the game. Practices would include everything and anything that could possibly be experienced during the game. As a coach, look for ways to guarantee players have already practiced everything before they actually see it in the real game, and always be analyzing practices by evaluating how well you are training your players for actual game performance.

PRINCIPLE #2

The Practice Conditions Should Provide For Variability

A second motor learning principle that is closely related to the encoding principle is called the "contextual interference principle" which stresses that random types of practice conditions are usually best. For example, if you are working on passing, it is best not to just practice passing from the same spot over and over again. This is called block practice and is not at all like the game of volleyball. How often does the player stand in one spot passing ten balls in a row from the same server from the same area? In random practice, the player might be asked to serve-receive 10 different types of

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serves from 10 different places from several different types of servers on the court. This random practice schedule best prepares passers to receive in the game. A further application would be after serve-serve, have players practice coming in for different type of sets and hits along the net with a full team coverage formation. Random practice has been proven to be effective in most situations. The only time random practice is discouraged is with beginners. For beginning players, coaches should start with a block schedule, practicing the same skill in the same way under the same condition repeatedly. The problem with most coaches however, is they continue this blocked practice schedule long after the athlete has acquired the basic skill pattern. Once the basic skill is demonstrated, random practice should be introduced.

PRINCIPLE #3 Learning Occurs in Three Distinct Stages

Motor learning is complex and consists of three distinct stages. The cognitive stage is when the learner creates a mental picture of the skill to be executed along with processing the visual, kinesthetic, and auditory cues needed for the skill. Performance during this initial stage is

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full of questions and errors as the learner attempts to get an idea of how to do the skill. During the second stage, called the associative stage, the learner begins to understand how to do the skill, and “associates” the movement with environmental cues. This stage is sometimes called the refining stage since learners begin to narrow the motor response and identify and correct errors on their own. The final stage of motor learning is termed the autonomous stage since the performance of the skill is now automatic. At this stage the learned skill is now a habit, requiring little attention. In order to reach this highest level, many years of practice are needed, and not all performers will achieve this final stage.

For coaches, it is important to identify which stage a player is presently, since different stages require different coaching skills. During the

initial cognitive stage, appropriate and timely feedback is needed to help the novice performer understand how to do the skill and how to correct errors. The coach is providing lots of encouragement along with appropriate feedback during the cognitive stage. During the associative stage, the coach's role shifts towards refining techniques. During this stage, the coach waits and allows the player to identify his or her own performance errors and correction. While the emphasis is on refinement, there are ample opportunities for practice to develop the consistency of the skill performance. Working with athletes in the final autonomous stage, the role of the coach again is different. Now emphasis is on developing strategies and tactics for using the skill in a variety of game situations.

PRINCIPLE #4 Consider Transfer of Learning When Teaching New Motor Skills

Transfer of learning is the effect previous experiences have on the learning of a new skill or performing a skill in a new context. The concept of transfer lays the foundation for all of skill learning. Transfer of learning can be positive, negative, or neutral. Volleyball coaches should be aware of the transfer of

learning effect and utilize it to help with teaching new skills to players or teaching already learned skills in new contexts. Positive transfer provides the foundation for teaching skill progression. Once a skill is learned, it can be transferred to new settings, or be the foundation for new skill learning. An example of transfer would be the overhand throwing pattern. Early in a child's development the correct overhand pattern should be established. This skill can then be applied across different settings and into new sport skills. In volleyball the spike and jump serve both derive from the basic overhand pattern. Ensure that this fundamental skill is acquired at an early age so that positive transfer can occur later in volleyball skill learning.

While positive transfer is a powerful tool, coaches should be aware of the role that

negative transfer can play as well. Although negative transfer is temporary, it does initially hinder or hurt learning a new skill. In volleyball, an example of this could be when players initially learn to jump off two feet when spiking, and then the coach tries to teach the basic one-foot take-off for the slide. Since negative transfer is not permanent, the coach should be patient as players work on learning similar, but different skills.

PRINCIPLE #5 Focus Attention on the Movement Effects Rather Than Just the Movement

Traditionally, coaches have the athlete focus on the internal movement of skills. For example, feedback statements such as “keep your elbows locked” or “reach and snap” have been the standard performance cues used for teaching the basic skills of volleyball. While such statements focus on the movement action rather than the effects of the movement, the motor learning research suggests that focusing on the external effects of movement also has a positive effect on skill acquisition. As volleyball coaches, we should explore the effectiveness of using more external focus of attention when instructing our athletes. For example when teaching the basic overhand serve, instead of cues such as “keep your elbow high; step forward with the opposite foot, and reach and make contact,” shift the focus to the external effects and see the results. External focus cues might include “see the ball up, step towards the target”, or “hand to ball to the serving zone.” When providing feedback for the basic pass, teaching cues such as “keep the ball low” or “see the pass to the target” might be added with “thumbs together and lock elbows” or “lift with the legs.” An external focus enables the performer not to concentrate so much on the movement itself, but rather on the effect or outcome of the movement and is effective.

Coaches always desire to enhance the performance of their athletes. Information from various disciplines such as motor learning can help assist the coach with this process. This article looked at five principles from motor learning literature along with applications for teaching/ coaching volleyball skills. Next issue's article will look at five additional motor learning principles that can also be used for effective skill acquisition and development for volleyball players.