

CHAPTER 5: MOTOR SKILL DEVELOPMENT

Since the early 1980's, there has been tremendous growth in the area of research on teacher and coaching education. One of the findings reveals that a university education produces three kinds of graduates and they fall along the following continuum:

- ⇒ At one end are found those who are unaware, uninformed, and unenlightened about current practices in teaching and coaching.
- ⇒ In the middle are those who are aware of current practices, but do not implement them. They have been swayed, but they lack the confidence and procedural knowledge to implement the concepts.
- ⇒ At the other end, there are those who are "imprinted." These are the teachers and coaches who clearly reflect many of the methods advocated at the university, in the current literature and in modern practice.

Methods used in **CAP** and **IMPACT** programs are based on current literature and on the practices that were employed in training the 1984, '88, '92, '00, '04 and 2008 Men's, and now Women's, U.S. Olympic volleyball teams. These methods are mainly those of Dr. Doug Beal, Bill Neville and Dr. Marv Dunphy, three coaches to whom all coaches owe a great deal of thanks. The biggest thank you, however, goes to their teacher, Dr. Carl McGown of Brigham Young University - the 1999 & 2001 NCAA Men's National Champion Head Coach - for all his sharing and teaching, specifically on the subject of Motor Learning in coaching volleyball.

I Hear and I Forget; I See and I Remember; I Do and I Understand.
~ A Chinese proverb ~

FOLLOW THE PRINCIPLES OF LEARNING

How many great teachers have most people had? What are their traits? There really is no difference between great teachers, parents or coaches – for following the principles of learning is the best way to get kids to learn the best. If yelling was the best way to teach then second grade teachers, history professors, and *all* teachers would yell at their students after each punctuation or historical date error. While it is traditional in sport, yelling does not follow the principles of learning.

Principles of Learning can be used to establish the foundation of skilled performance. These are referred to as **motor learning principles** (*motor learning is an area of psychology that studies factors that influence the learning of motor skills*), and research has shown that if used as coaches' essential truths then their athletes will both improve and retain their ability to perform skills.

One such Principle involves deciding on the **keys** and **verbal cues** to use to teach the skills and the order in which they will be presented. There is some evidence to suggest that more successful teachers do this better than less successful teachers. It is also important to combine demonstrations and keys into an effective teaching method! Even though at a past **USAV-CAP** National Seminar/Level III course on International Coaching the fact was revealed that the #1 factor influencing success is athletic talent, not coaching, many coaches become more effective and successful teachers **because** they follow the Principles of Learning when training their players.

PLANNING EFFECTIVE PRACTICES

In the model presented, the learner must formulate a motor program. Many motor learning experts believe that the motor program is a type of central representation (an image in the mind) that controls actions and movements. So the actions and movements of volleyball players (like serving, passing, spiking, and etc.) are controlled by their motor programs. Obviously, making certain that athletes develop effective motor programs as soon as possible is one of the most important tasks facing coaches.

NOTES:

Dr. Peter Vint, USOC Director of High Performance based at the Colorado Springs Olympic Training Center, has this to say about Learning Theory the best way to accomplish this:

“Sure, learning **quickly** would be really great! However, the **literature is clear in stating that the deepest and therefore “best” learning (as indicated by performance retention under varied conditions) is usually accomplished by a process called ‘IMPLICIT LEARNING’ – where the learner comes to understand a principle, or concept, or relationship in a deeply personal way. That is, they have their own ‘Eureka!’ moment.** Unfortunately, this process may take much longer than other types of learning.

By way of example, let’s assume we want an athlete to improve his or her middle blocking performance, and in particular, his/her ability to read the play to improve the speed and accuracy of their initial decision making.

IMPLICIT LEARNING:

In this scenario, **the coach would define the skill and expected outcome for the Middle Blocker: “You need to read the play so you can make faster and more accurate decisions,”** but they effectively leave it to the athlete to determine how to do that on their own or to figure out to what information they must attend. Hopefully, the athlete would figure it out and by doing so on their own, the Middle Blocker would come away with a very strong understanding of this aspect of the game. Unfortunately, it may take a long time for this to happen and perhaps it **never** would.

EXPLICIT LEARNING:

In this case, **the coach not only defines the skill and the expected outcome, but also defines the stimulus and response for the Middle Blocker. “When you see this, do that.”** No attention is given toward the Middle Blocker **understanding** or actually **internalizing** the cue, but just presents a superficial “if-then” situational response. This is generally a learning technique that can yield very rapid changes in performance (and therefore useful during in-game, time-out situations) but **results in very poor retention and very shallow understanding.** The may cause athletes to resort back to prior habits under conditions of stress and anxiety.

GUIDED DISCOVERY:

In this third (and best) option, **the coach defines the skill and expected outcome, and also provides some guidance on which cues to focus on without explicitly stating the cause-effect relationship. “Watch what happens when the setter arches his/her back...”** By providing “hints” to the Middle Blocker without giving a “rule,” the athlete is still able to “discover” the answer and learn the relationship in their own more meaningful way. The advantage of this approach is that it **typically takes less time than Implicit Learning, but may also yield results comparable to those obtained under Implicit Learning.**

To continue this discussion about Principles of Learning and how to efficiently develop motor programs, the issues of specificity vs. generality, transfer, whole vs. part practice, state-dependent remembering, random vs. blocked and variable vs. constant practice need to be examined.

Specificity vs. Generality - Does general athletic ability really exist? Most people believe in general athletic ability. They believe that someone who can play baseball very well should be able to play golf very well, that someone who can play basketball very well should also be able to play volleyball very well, and so on. Back in the 1920’s and 1930’s several prominent physical educators even went so far as to develop a number of general athletic ability tests. Modern physical educators, led by a scientist named Franklin Henry, no longer accept the notion of general athletic ability. Instead, they believe that abilities are specific to the task or activity. This statement by Henry (1958), even though it was written over 40 years ago, is typical of the current beliefs:

“It is no longer possible to justify the concept of unitary abilities such as coordination and agility since the evidence shows that these abilities are specific to the task or activity.”

Consider then that it remains the same, decades later, where Savelsberg and Van Der Kamp, (*International Journal of Sport Psychology*, 2000) ***“defend the thesis that information and movement are tightly coupled and as a result specificity in training is required to get meaningful learning effects...If motor performance has to be learned and improved, a coupling between information and movement has to take place. Because such coupling only emerges under a set of specific constraints, specificity of learning it needed. That is, coupling is specific to the situation in which it is learned.”***

As Dr. Vint points out, Savelsberg’s comment is getting at something called **“PERCEPTION-ACTION COUPLING.”**

That is, learning is more effective when all components (cognitive, perceptual, and motor) of skill are included in its execution which also pertains to the “WHOLE vs. PART” discussion to follow. The general message here is that ***specific practice is required (or best) to perform a specific motor task in a specific situation,*** though I would contend that ***the practice design literature also shows that such specificity can be quite limiting.***

Dr. Vint goes on to explain that,

“ I believe we sometimes make the mistake of failing to synthesize the “specific vs. general” concept with that of **“CONSTANT vs. VARIABLE”** practice. While constant practice **can** be useful for execution of skills in constant environments, ***variable practice tends to extend the “motor schema” and facilitates more robust and higher level performances in “different” situations/environments.*** I like to relate this idea to that of “specific vs. general” practice or experience: Those who are ***trained in narrow and specific performances*** may in fact ***develop to be quite talented***, but those who are ***trained in broader and more varied performances***, while lacking perhaps some of the nuanced technical execution, ***are often able to perform at equal or higher levels because of they have used their bodies in more varied ways and developed a more comprehensive (albeit “general”) set of motor abilities.***” ~ Dr. Peter Vint

TRANSFER - How much will playing “pepper” help develop backcourt defense? If the conclusion that motor programs are very specific is accepted then it is possible to make a number of predictions. One of the predictions is that there will not be motor transfer from task to task. Pepper might not transfer very much to backcourt defense. The issue of transfer is of crucial importance to coaches because every drill that players perform and every practice a coach designs is expected to produce large amounts of transfer to game situations. However, if playing pepper does not do much to improve the skill of digging hard driven spikes then it may be because there is not enough transfer between the drill and the competitive activity.

The research here seems to say: “There is not as much motor transfer as we might think.” Schmidt (1975) summarizes the research when he says, ***“There has been a great deal of research conducted concerning transfer from one variation of a task to another variation of the same task. . . . One is forced to the conclusion that the amount of motor transfer is quite small.”***

Additionally, Dr. Vint also has this to say on the subject:

“While there may not be direct 1 to 1 transfer between a baseball pitcher’s ability to attack a volleyball, there is likely to be some POSITIVE transfer. A baseball player who has never played volleyball is likely to be more capable of learning to attack a volleyball with an “ideal” form than a wrestler who has a less mature “overhand throwing pattern would be.” Put into the context of a volleyball practice, I would still prefer to teach the wrestler-turned-volleyball player to attack a volleyball rather than to first throw a ball and then learn to attack a ball... but there are some similarities, which can in fact, and do, transfer. Understanding that positive transfer is good, negative transfer is bad, and greater positive transfer is better than less positive transfer, drills should be designed to maximize any positive transfer and minimize (if not completely eliminate) any negative transfer.”

WHOLE VS. PART – So, should players practice all of the spike or only part of the spike? This area is complex because there are problems with the definition of a “whole” and of a “part.” In spiking, the whole is the approach, the jump, the arm-swing, or contact of the ball, and the recovery. A part might be just the approach or the arm-swing.

Unfortunately, there is not space to go into all the issues, but it is possible to say that if motor programs are specific, and if there is not much transfer between various tasks, then when we are trying to develop a motor program, whole practice should be better than part practice.

NOTES:

Nixon and Locke (1973) studied the research in this area and discovered that:

“In the 30 whole-part studies reviewed, not one favored teaching methods that used the part or progressive part methods of instruction. In the majority of studies, some variation of the whole method was associated with superior learning.”

Coaches often break spiking into parts for instruction: first the spiking action or arm-swing against a wall, then the approach without a ball. Finally, they combine the two. According to Nixon and Locke it would be better to start with a whole spike in the beginning, as has already been recommended, and use keys to teach the arm-swing & approach.

“It’s still an attack – it’s just a bit different this time than it was last time. The broader the repertoire, the more adaptable the response can be. This repertoire may be extended directly through variability in training conditions – which I believe can include participation in other sports.”
 ~ Peter Vint, USOC Biomechanics

Dr. Vint believes there is sufficient evidence to state that **motor variability is a good thing** and athletes should be encouraged to “explore” this space **by playing live games** and by being **coached by coaches who promote environmental and situational variability**.

This is compatible with what Schmidt calls “**schema theory**” which essentially accounts for **an ability to execute a generalized motor response** (an attack, for example) **in a number of novel ways** and **under a number of novel conditions** (set is too high/low; tight/off; fast/slow). So, when an attacker correctly adjusts to a poorly set ball (or poorly timed approach), they are able to **elicit an appropriate motor response by drawing upon a pool of available and compatible motor abilities**.

STATE DEPENDENT REMEMBERING AND TRAINING - What things do our athletes remember? Cognitive psychologists have shown that remembering is very state-dependent. This is a complex term, but what it means is when a person learns something and it becomes a part of memory, information about the **mood of the learner** and the **surroundings of the environment** is also stored in memory with that information. **Performance is significantly better when the environment in which performance must occur matches the emotional state and the environment in which learning occurred**. No wonder an inexperienced athlete has difficulty performing before a large audience and that there is such a thing as a “home court advantage.”

RANDOM PRACTICE IS BEST!

The concept of **RANDOM vs. BLOCKED** practice pertains to the distribution of repetitions on a given motor task (or drill). Serving 20 times in a row would be indicative of blocked practice.

“Random practice probably operates by preventing the learner from simply repeating the movement output on successive trials, requiring the learner to generate the entire movement process on each trial”. ~ Schmidt (1975)

Serving 2 times, then passing a few times, then serving 3 times then...is indicative of random practice. Relative to blocked practice, where trials of a single given task are repeatedly presented, **random practice produces far better performance and retention**.

“VARIABLE vs. CONSTANT” practice pertains to the conditions in which the skills are performed. Serving 20 times in a row from the same side of the net is blocked *and* constant. Serving 2 times, then passing a few times, then serving 3 times from the other side of the net then...is indicative of random *and* variable practice. **So, Variable Practice involves intentional variations of a given task** and compared to constant practice, where only a single variant is practiced, **facilitates retention and generalization**, particularly to a novel situation whose specific variant has not been received prior to practice (Schmidt).

“When teams practice on the same court in the same direction with the same balls at the same time of day, it is constant. When they practice on different courts or on different sides or at different times of day or with different balls or against different teams, it is more random.”

~ Dr. Peter Vint

So, should practice be blocked or random? Should it be variable or constant? Armed with knowledge of specificity, little transfer, superiority of whole practice, and the state-dependency of learning and remembering it seems logical to make one last prediction... **drills that introduce the variability we normally find in a game (this would be random/variable practice) will transfer better to game conditions than drills where the trials are blocked/constant**. For instance, forearm passing skill is necessary for volleyball, but it is often practiced in situations where the ball comes from the same place and returns to the same place.

The previous scenario would be an example of “constant” practice, (and blocked practice as well if this activity is not interspersed with other practice activities) and many successful repetitions can occur with this type of practice.

However, a volleyball skill is rarely performed under such stationary, consistently perfect or repeatable conditions in a game, so constant practice doesn't transfer very well to our game conditions. It is clear that practice situations with unpredictable events must be created for performers to experience **before** encountering the unpredictability of the full game.

Anything less than a game situation, unless very well-planned, has the possibility of introducing artificial situations and complete transfer to the game might not occur. When drills are constructed, the teacher should carefully consider the environmental movement relationships in the drill to determine that they are as close to the game as possible.
 ~ Marteniuk ~

MASSED VS. DISTRIBUTED PRACTICE - The main question here is how should the work and rest in practice be distributed? ***"MASSED vs. DISTRIBUTED" relates to "work-rest" ratios (time between repetitions or drills) while "Blocked vs Random" relates to the distribution of repetitions (20 serves in a row vs. a few throughout different parts of the entire practice).*** So, if a coach wants to practice serve reception for 30 minutes every practice, how should the time be scheduled? Would it be better to do all 30 minutes at once without resting (massed practice) or would it be better to break the time up in to smaller blocks, maybe 10 minutes each with rest or other activities between (distributed practice)?

Similar questions have resulted in a complex research area that has been studied extensively for almost 90 years. There have been problems with the basic findings, but there is recent evidence that ***massed practice reduces both the performance and learning of a motor skill*** (Lee & Genovese 1988).

Therefore, the best procedure for a coach is to provide distributed types of practice. For example, it would be better to do smaller bouts of serve reception as opposed to one long 30-minute session. In fact, instead of simply inserting rests between bouts of serve reception practice, it is wise to insert other activities (like serving, or spiking, or any other volleyball activity). With this system, the advantages of distributed practice (no depressed performance or learning) and massed practice (many opportunities to respond) are both realized.

Ideally, practice designs should be random and variable. Particularly for athletes who have a good working skill base, we should not have extended periods of blocked practice (e.g., 20 serves in a row), but make athletes combine a prior or following skill with each serve to replicate the distribution of skills within the actual game of volleyball.

LONG TERM ATHLETE DEVELOPMENT (LTAD) MODELS

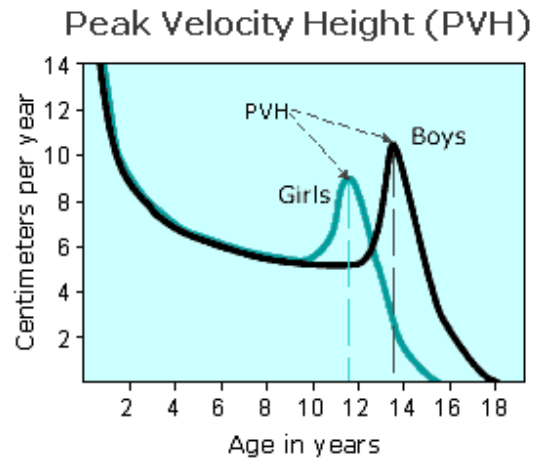
LTAD is an integrated training, competition, and recovery program that establishes guidelines for coaches/athletes/administrators/parents in all areas, including planning. It takes into account the program training and competitive schedule and the overall demands on athletes. LTAD is about identifying potential and providing appropriate developmental pathways for that potential to be fully realized, as well as ensuring that anyone, at any age and experience level, who wants to learn the sport has that opportunity. Sports scientists have reported that there are some critical windows of optimal training for young athletes during which learning and training can be maximized. They've also noted that it can take anywhere from eight to twelve years of training (10 years/10,000 hours rule) for a talented athlete to achieve elite status. These conclusions led to development of athletic models, which identify appropriate training goals and strategies at each stage of physical (as well as mental, emotional and social) development.

Research has also shown that that a youngster's chronological age is not the best indicator on which to base athletic development models for those between ages 10 to 16, because there is a wide variation in development during these years. In other words, all 12 year olds are NOT the same in their development physically, cognitively and emotionally. Yet most coaches tend to treat them all the same when it comes to developing a training plan for their U12 teams.

NOTES:

One practical solution suggested is to use the onset of “Peak Height Velocity” (PHV), which is influenced by genetics and factors such as climate, culture and social environments, as a reference point for the design of optimal youth training programs.

PVH is the point in a child's development when they reach their maximum growth rate. The average age for reaching PVH is 12 for girls and 14 for boys. Peak weight velocity normally follows shortly after PVH. After the PVH is reached, VO₂max and strength increase significantly as a result of growth. Most girls experience their first menstrual cycle approximately one year after their PVH. Using periodic measurements (such as standing height & sitting height) the athletes' PHV can be monitored and appropriate training programs can be created to match the individual athlete's development.



Sports may be classified as either early specialization (like gymnastics) or late specialization (like Track and Field, and many Team Sports such as Volleyball). Early specialization sports require fewer phases in their LTAD model while a late specialization sport model requires more phases.

USAV's future LTAD model will be based on the work done by Dr. Istvan Balyi, a world leader in LTAD models and creator of the Canadian National Sport LTAD, as well as on the American Development Model (ADM) created by USA Hockey. You can read more about each development model in the Resource section found at the end of this chapter.

SEE-DO-TELL or SEE ONE-DO ONE-TEACH ONE

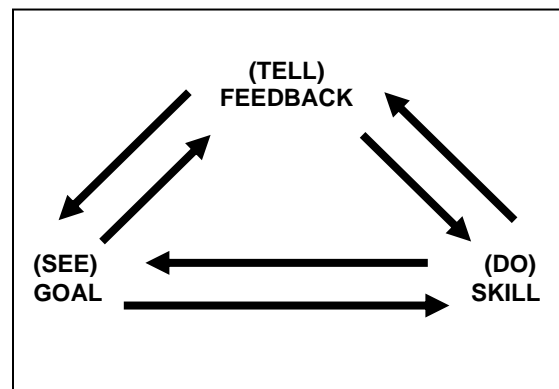
For this *USA Volleyball/RVA IMPACT Manual*, the following illustrates a simplified model of the way young players acquire motor programs, including all volleyball skills. While coaching, keep in mind that youngsters learn better by seeing and then doing than by hearing. Remember, you must have good modeling skills, even if you cannot play volleyball. All other **USAV-CAP** courses spend a significant amount of time on court, helping coaches develop their ability to **demonstrate the proper skills**, not just talk about them!

Drills and lead-up activities take considerable practice time and do not produce much transfer, so use them sparingly in later practice stages.” AND “It is fruitless to try to train fundamental abilities, (e.g. quickness, balance) so concentrate on the fundamental skills instead.”
 ~ Dr. Richard Schmidt,
 Prof. of Motor Skill Research ~

LEARN TO CREATE WHAT IS NEEDED

There is no “one way” to play this great game. **IMPACT** and **CAP** Instructors care only that coaches are as efficient as they can be in getting their ideas across to their players, for coaches have only a few hours a week to train athletes in this unique sport.

The diagram at right is a presentation of basic concepts regarding motor skill acquisition. This includes a learning model, Gentile's Model (from A.M. Gentile, “*A Working Model of Skill Acquisition with Application to Teaching.*” Quest 17:3-23, 1972) that has been modified by Dr. Carl McGown, former Professor of Motor Learning at Brigham Young University. Much credit for the following section must go to Dr. McGown, researchers like R.A. Schmidt, R.G. Marteniuk, Renshaw and others. Indeed, every single one of the coaches in this Clinic should have Dr. Schmidt's book on their shelf, *Motor Learning and Performance*, written in 1991, and revised three times. It is available through Human Kinetics. If all coaches would read it, their practices would change even more than can be shared through this *IMPACT Manual*.



A player sees a goal –a technique – tries to do it and then compares how he or she did to the image of the goal. Volleyball is a complex series of acquired habits. **Make sure the habits players gain in practice are actually habits that will help them in the game itself.**

THE GOALS

What this means is that young players need to **see** what they are supposed to be attempting. **In sports, a picture is truly worth a thousand words.** This picture may be in the form of the coach as the model, a teammate who is doing the skill correctly or a more-experienced, better-skilled team. Seeing the model in person is best, and the use of a video can also be a great way to present a technique goal.

When developing goals, keep the following six statements in mind:

- Humans have a limited ability to process information. Therefore, performance at all levels of learning can be facilitated by **reducing the amount of information to be processed** (smaller “chunks” of information.)
- The group of subjects who received the most complete instruction made strikingly little improvement (Renshaw and Postle).
- **Words have little meaning for the beginner in motor skills** (Berlin).
- Movement information is retained in short-term memory **in the form of an image** (Marteniuk).
- Learn what all good teachers must learn: **images are better than words; showing is better than telling; and too much instruction (feedback) is worse than none** (Gallwey).
- Most tasks are learned at a faster rate **when repeated demonstrations are shown** (MacCoby and Sheffield).

Show Then Tell - As stated above, **words have very little meaning to beginning skill learners**. Generally, the smallest percentage of new players are auditory learners. If coaches were to administer a Learning Styles Questionnaire to their athletes, the results would most likely show that very few athletes on their team learn best by just hearing instruction. Most need to see it and or do it to learn best.

Once coaches have shown the desired goal, and players have had the opportunity to observe the goal presented from two or three different angles, ask questions to see if the players understand. Players should be able to tell the coach in their own words what they are learning. Players must know that they are to copy the model to the best of their ability, yet since all are individuals, one cannot do the skill identically to the model. Only the core actions need be the same.

There can be goals presented that are not just visual that must become part of the motor program as well. The sport of volleyball has three important areas of training: technique (how to do it), tactics (what to do) and experience. As coaches model and train their players, the tactics will also need to be introduced as they apply to that level of the game. Let players know why the skill is being learned and how that goal relates to their team play.

More Individual Demonstration - Once everyone has seen the completely new action in a demonstration, only stop the whole team to correct errors that **everyone** is making. Instead, **individually correct errors, showing what the correct action is** and avoid demonstrating the erroneous actions. Coaches are the source of information and if the information the coach is presenting to one player is incorrect (“*See, you are doing it wrong like this*”) a player not privy to this may interpret the individual error demonstration as a “special” hint to use rather than an error to avoid. Coaches must keep demonstrations limited to **what they want players to do**, not showing what they are doing wrong, because they already can do it the wrong way. Feedback & instruction should be given in an affirmative tone. That is, “**DO THIS...**” is far more effective than “**DON’T DO THAT...**”

SKILLS: THE GAME TEACHES THE GAME

There are many skills and variations to learn in volleyball. Each skill is a separate motor program with a response to be compared to the goal. Research has shown that transfer is limited between tasks and skills.

NOTES:

DELIBERATE PRACTICE: or “How people get great at something!”

- “Deep Practice” ...intensely focused start-stop observation and experimentation, in which the practitioner is constantly making mistakes and looking to correct them one by one.
- “Earning Myelin” ... building skill, as effectively and rapidly as possible. Myelin increases via deep practice and, in turn, increased myelin affects the signal strength, speed and accuracy of electric signals traveling through nerve fibers.
- Motivation (Ignition) or “Deep Passion”... “Where deep practice is a cool, conscious act, ignition is a hot, mysterious burst, an awakening.” This deep passion is a necessary part of the attainment of great skill.”
- Master Coaching ...world class talent requires help, feedback and guidance from disciplined, committed coaches; everything a master coach does, down to the slightest interaction, is meant to maximize skill transfer.
- 10, 000 Hours ... of disciplined practice necessary to be GREAT!

*Daniel Coyle, *The Talent Code*

Throwing a baseball is a motor program that is stored differently and separately from the motor program for serving a volleyball. They may be similar motions, and some positive transfer (or negative transfer if the athlete has learned a sidearm throwing motion) may exist, but each must develop a separate motor program. To get better at a skill, one needs to *perform that specific whole skill many times*. **Therefore, progressions should not be needed for most players.** This is a very important factor for efficiency in training volleyball players.

**The Ball Teaches the Skill...
The Players Teach the Players...
The Game Teaches the Game.**

Players should attempt the whole skill in its simplest form, then get information from themselves or the coach on what needs to stay the same and what needs to change. No athlete was born with innate volleyball skills. Players may not do it perfectly the first time, but with enough trials they can do just about anything they are asked.

Limit Progressions - Part of a coach's job is to limit the errors being made, keeping success high enough to develop consistency and confidence. A progression – in this case the performance of just a part of a whole skill - may be needed with some players who have a consistent flaw in their skill action. These types of corrective progressions are **implemented on an individual basis**, not with a whole group - unless **everyone** is making the same error!

Coaches may start (or review at any time) without a ball by simply having the player rehearse the skill. Has the player copied the model fundamentally? There are often major parts that are already being done wrong, even though the ball is not involved. Coaches can perform many trials in a short time with an individual or a group, if they are only rehearsing the model.

Such errors in volleyball, even for the younger players, are often caused by prior motor programs that negatively transfer. Other sports previously played or even imagined can override the image of the goal for the volleyball skill. The basketball jump shot, for example, has movements that form the basis of an incorrect spike approach and improperly shaped hands for setting – both which may have negative transfer to learning volleyball skills.

In other examples, cheerleaders may have odd arm swings and basketball players may step incorrectly for volleyball techniques. Coaches cannot change those prior motor programs, but instead must help athletes instill new ones for the correct volleyball skill.

The problem with chopping up skills into progressions for teaching is that they are an inefficient and ineffective way to teach the motor skills of volleyball, and they certainly do not follow the principles of specificity, transfer, and whole practice that were outlined in the above discussions.

However, it is clear that “*progressions*” of another type (simple to complex) must be used to teach motor skills. If a coach wants to teach a young boy or girl how to spike a volleyball they cannot start by having two intimidating blockers block every ball he or she hits; the principles of motor learning should also indicate to the coach that hitters shouldn't start with the ball on a spiking tee either. So what rules can be outlined for progressions? There are three:

- **Progressions should be limited in number.** Players need appropriate regulatory stimuli.
- The progressions that are used should be as much like the game of volleyball as possible.
- Extensive progressions can be used if there is fear or danger involved in learning the skill.

Nixon and Locke (1973) add support to the idea that extensive progressions are not effective when they write:

“Progression is a near-sacred principle in physical education and is taken most seriously in teacher training. Evidence indicates that the faith . . . may be misplaced. . . Progressions generally appear not to be significant factors in learning many motor skills.”

If coaches want to teach players to set the ball, the first thing they should have them do is observe the model and then set the ball. Setting the ball while lying on your stomach or attacking the ball down to the floor to bounce against the wall is not anything like how those skills are to be used in the game of volleyball. If coaches want athletes to learn to attack, then the first thing to do is have them observe the model and then attack the ball. Remember the recommended teaching method? Have them set with emphasis on a key (with appropriate verbal cues as shorthand reminders), or have them attack with emphasis on a key, and work through the three or four keys that will be used to teach the skill.

Please don't waste their time by having them perform all sorts of activities that are not in any way going to develop the specific motor programs required for volleyball. There isn't much transfer from lying on the stomach to setting an actual ball, so why practice it? If coaches structure practice sessions have a greater percentage of transfer to actual game play each day than the opponents' practice sessions do, then it won't be long until their team is much better than the opponent's team.

Make Beginners Move - When the ball is first introduced, use only moderate amounts of movement— **but there must be some movement**. As long as the player can do the skill correctly without the ball, he/she is demonstrating an acquired skill. Now the player must learn to get to the ball. Indeed, making a player first move to a ball over a long distance (with likely little success) and then quickly bringing the movement demands down to a much smaller amount, makes players focus on moving. Too often, beginners do not move to the ball, "better the ball," or get to the ideal position for ball contact. They must clearly understand that nearly all of the movement in nearly all ideal volleyball skills is done **prior to** the player actually touching the ball!

Add the options as found in **BASE** drill development (covered in Chapter 6) such as different ball flights, higher goals, more movement demands and simple-to-combination skill performances as a way to both challenge athletes to improve and to maintain success in any skill development.

Speed First, Accuracy Second - Learning the whole skill means, that speed is first and accuracy is second when judging success in learning a new skill. **Learning below the normal speed just means one must re-learn the skill at the correct speed later**. Coaches may understand that speed should come first and accuracy second in learning a skill, but then they will say in a match, "Just get it in!" Where did their patience go? This point about game speed also solves many skill problems; if a player cannot serve over the net or set very high, have them stop worrying about accuracy and tell them to move their arm(s) **faster**. The end result is the ball goes farther or higher or faster and the accuracy will follow!

"I was taught to hit the ball as hard as I could, and find the court later." ~ Andre Agassi

NOTES:
SECRET WEAPONS: Teaching Anticipation, Reading, Timing & Judgment

Volleyball techniques and skills must be taught with reading and anticipation cues and clues included. Otherwise, learning the skill without this "advance" knowledge is near worthless. Timing and judgment are also important in that they enable the player to determine when and where to perform the necessary skill.

Check for understanding of a technique with players by having them perform the skill WITHOUT the ball. If they demonstrate a technique error then this is evidence that they do not understand the technique goal or model. If they demonstrate solid form without a ball then there is no longer the need to remind them of the right technique, because they know it. Instead, when a player shows "poor technique", it usually is the result of an error in:

Anticipation ~ Reading ~ Timing ~ Judgment.

These four keys to successfully playing volleyball are truly only learned in **game-like situations**, at **game-like speeds**, with balls rebounding at varying angles, and coming or going over the net on the first, second or third hits...*like they do in a game!* If athletes would simply play and practice in groups of three or more, rather than with a single partner, in nearly any variation of a drill or game then they will learn the "magic" of Anticipation, Reading, Timing and Judgment!

SECRET WEAPONS: continued

In an article titled “*Reading the Play in Team Sports – Yes, it is Trainable!*” (*Sports Coach Magazine*, Vol. 27, #3, 2004), Dr. Damian Farrow reports on the debate over whether the ability to read the play is innate or trainable. He is talking about a player’s ability to accurately forecast a game’s future, thus appearing to have all the time in the world to play the ball. Farrow reports that while some players may naturally always be better than others at this, there is a great deal of evidence that indicates that players are able to learn to read and anticipate a situational outcome. This is called “pattern recall” or “pattern recognition”. While the pattern of a developing play on the other side of the net may look meaningless to beginning volleyball players, to an expert player or coach it will look completely logical and will give them several early clues as to what will happen with the ball next. This in effect gives them a “jump” on the reading and reacting to the play that beginners will not have.

Teaching Anticipation, Reading, Timing and Judgment: The Myths

This seems to be because the experienced players have the ability to “chunk” all of the action on the court into fewer and larger “chunks” that are easier to remember and recall when facing similar future situations. Through years of practice and game experience they have developed the ability to rapidly recognize and memorize opponents’ patterns of play.

So how can volleyball coaches train these abilities? Well, obviously, the more games the athlete plays, the more likely they are to learn specific attacking and defensive strategies to develop an understanding of where and how the ball will be passed or attacked. As Farrow explains,

“Whether a player then becomes a skilled decision-maker relates to whether their coach draws their attention to such details. Coaches who provide their players with game-based training opportunities rather than stereotypical drills with minimal decision-making requirements are likely to develop more competent decision-makers.”

Reading skills can also be developed and trained off the court by asking players to predict what is going to happen next when watching videotaped game play. Ask the players to actually put themselves into the action to answer questions such as, “*Where should the setter set the ball off this pass?*”, or “*Where would you hit this ball if you were the attacker?*” Volleyball coaches can give a court diagram to each player, let them watch the play develop, then stop the video action and ask them to draw what they think should happen, then play the tape and compare their answers to the actual result of the play. This works especially well when training young setters on set selection and placement.

While some players may already have this innate ability, most athletes can improve their reading and anticipation skills by having a coach who provides them with game like practice activities that require players to make the same sort of decisions they will be required to make in a competitive match.

In another article titled “*Perceptual Expertise in Sport: Some Myths and Realities*”, (*In the Dawn of the New Millennium: Proceedings of the 10th World Congress of Sport Psychology*, 2005). Dr. Mark Williams (Research Institute for Sport and Exercise Sciences in Liverpool, UK) lists some common misconceptions about such “Perceptual Skills”. Williams presents several observations regarding Perceptual Skill in sport which demonstrate that experts have several advantages over beginners, which are reflections of the experts’ superior ability to process sport-specific information. As a result of experience amassed through many hours of planned, purposeful practice, experts have developed a wide-ranging base of sport-specific knowledge that allows them to form accurate expectations of likely events. Experts confirm these predictions through the effective processing of contextual information. These skills seem to develop at an early age and are open to improvement through transfer from related activities and via specific training and instruction.

The Myths

Myth #1 - Skilled performers possess superior visual systems compared to less-skilled athletes.

The general consensus is that they do not, however an effect **was** observed that was related to the age of the performer. Results also suggested that the visual system might set the limits for sport performance, but was unrelated to the skill level of the performer.

Anticipation, Reading, Timing and Judgment: The Myths, continued

Myth #2 - There is no evidence to suggest that Perceptual Skills transfer across sports.

More recent research shows that there may be **some** transfer of pattern recognition skills between similar sports, such as between soccer and field hockey. The amount of positive transfer is very dependent upon how similar the typical patterns of play, the strategies and tactics within each sport are to each other. Evidence also suggested that participation at an early age in a wide variety of related sports might also be beneficial to development of Perceptual Skills.

Myth #3 – Perceptual Skills cannot be improved through instruction and practice.

The widely held belief is that Perceptual Skills are genetically determined and not very receptive to practice and instruction, however there is evidence which indicates that cognitive exercises that develop the knowledge bases underlying skilled perception have practical value in assisting with the acquisition of expert performance. Video simulation may be especially effective in helping to develop Perceptual Skills, particularly when joined with appropriate instructional techniques. Already skilled performers may benefit from this type of training even more than less skilled players.

Teaching Anticipation, Reading, Timing & Judgment: The Realities

Key Facts about Perceptual Skills in Sport

Key #1 – Experts are better able to recognize and recall structured patterns of play (“chunks”). They are aware of typical offensive/defensive patterns used by opponents, and as a result are able to recognize and “read” the developing pattern of play much earlier in its development, thereby making “anticipation” seem easy.

Key #2 – Experts are better able to anticipate opponents’ actions using advanced visual cues.

Because of the time constraints placed on athletes to react in a game situation, the ability to anticipate opponents’ actions based on advance sources of info is essential. Experts are able to rely on (“read”) earlier sources of information...from the volleyball attacker’s angle of approach and plant, the angle of the hitting shoulder, the take-off position relative to the set ball and the blockers, the elbow and hand position, etc.

Key #3 – Experts employ efficient and effective visual search strategies.

These experienced athletes are able to use their superior knowledge to control the eye movement patterns necessary to seek out and pick up important sources of information in order to anticipate the next action. As in all sports, beginning players are guilty of “ball-watching”, whereas skilled players fixate on the positions and movements of players “off the ball”. Expert players alternate their eye focus and attention between ball and player more frequently than novices, which is important in anticipating opponents’ movements.

Key # 4 – Experts are able to better pick up the minimal essential information underlying skilled perception. Research has shown that experts are better at pulling out important opponent motion information from video and point of light displays than beginning players. This may be that the relative motion information present in the transition from one body or court position to another provides the expert with the minimal essential information source that underlies skilled perception.

Key #5 – Experts have superior knowledge of situational probabilities.

This means that more experienced volleyball players use knowledge stored in their long-term memory to determine accurate expectations of probable events as the action unfolds. Advanced players can dismiss some possible events as being “highly improbable”. They can then assign a hierarchy of likelihood to the remaining events, thus making possible their “anticipation” of which players are in the best position and are more likely to receive the next ball. It seems experts “hedge their bets” more than beginning players by putting both their expectations and processing of situational information to effective use to “read” and “anticipate” future actions.

Key # 6 – The perceptual processes of experts are less affected by changes in emotional state.

This means that advanced or experienced volleyball players’ visual search abilities are less affected by their emotions and anxieties during competition. Beginners often let their emotions and anxieties rule their play.

Key #7 – Perceptual Skills develop at an early age.

Perceptual Skills have been shown to be more of a predictor of talent as children mature. Research has shown that elite soccer players could be differentiated on the basis of their Perceptual Skills as early as 9 to 11 years of age.

Limit Partner Training - This interferes with making key decisions. When coaches let kids train in partners, they take away a vital part of the game, that of **making a decision as the ball is in flight** of, “Mine” or “Not Mine.” Many skill errors in volleyball can be observed, even at the highest level at times, but indecision and players not knowing if the ball is theirs to play or not may not be as easily identified. **Partner training does not develop this vital mental skill of decision-making**, only small group and full team training does.

Develop Skill Now, Condition Later - One final point about each skill- fatigue **is detrimental to skill performance and learning**. There’s no need to learn to “play while tired” in practice. **Give players mental and physical rest when needed and condition them separately**. Conditioning for endurance itself should be done at the end of any practice, or on off days, or as “homework” if at all.

If players have a low skill level in relation to their opponents, then simply skill train more. Conditioning may even be eliminated as a part of gym practice, except that which is incorporated into game-like drill design. For example, in most serving drills the players wander around, never sprinting to their area of back-row defense. This is a missed chance to condition in a game-like way during practice.

FEEDBACK/FEEDFORWARD

Better feedback leads to better learning. **Information feedback is the most important variable that controls learning and performance**. Perhaps a better term is “**feed-forward**” because coaches want their players to be thinking of what should be done better next time, not what he/she might have done wrong last time.

Remember the discussion above on Intrinsic vs Extrinsic Learning Theory? Feedback also comes from both intrinsic and extrinsic sources. Intrinsic feedback comes from within a player, and is best, as shown in the prior discussion. Extrinsic feedback is augmented by things outside the player, including the coach. The coach’s modeling skills may be needed for the valuable feedback they provide to each player.

Information obtained **after** a response is called **information feedback (IF)** and is **generally viewed as the most important variable for determining learning**, apart from practice itself. It is beneficial to establish a few principles that will assist coaching:

- The amount of information that is presented must not overload the information processing ability of the athletes. Coaches who do not use keys (like the ones discussed earlier) are more likely to overload than those who do use them.
- Two types of information can be given: **knowledge of results** (information about the outcome of the response, like “*that was a straight down spike*”) and **knowledge of performance** (information about the way the response was performed, such as “*your four step approach was perfect that time*”).
Because knowledge of performance (KP) is not easy for the learner to obtain alone, **it is especially important for the coach to provide KP in the early stages when the learner has not yet developed an internal standard of correct performance.**
 - “*Though too much, too detailed feedback may slow the learning process for beginning learners, “advanced” performers can better sift through the “noise” to get whatever they need out of the feedback. However, a player who serves a ball out **knows** they served out (knowledge of results) and they don’t need **that** information from the coach. Here, providing too much instruction on the “performance” (toss too low/high/forward/backward, contact point too low, etc...) may be in fact be worse than no instruction at all, but more because no instruction requires the athletes to “figure out” the problem on their own – which again is **Implicit Learning** - very deep and very robust learning, but which may take a long time.*” ~ Dr. Peter Vint
- **Use Videotape**. If there is any way of borrowing and using one, a videotape system can provide great models and game examples, as well as be a valuable tool to show each player what they look like. Because well-played volleyball is not well-known, tapes of real youth volleyball and adult games can be a great help. Tapes may be available from the RVA or National Offices. When using the system to tape each player, continue with positive coaching during the replay.

Another is the full report of what one’s body did in the trial, not what the ball did. Yet another might be to highlight certain areas of feedback with a judgment of each trial according to the goal. Performing any of the skills in front of a mirror is an excellent form of feedback, as would any coach “mirroring” or modeling.

MYTHBUSTING:

The actual answer to this question (and not what “*tradition*” says) may surprise you! How much “power” does the wrist snap **actually** add to the spiking motion?! Place a % of what you think each body segment adds to the power of a spike...

A. _____ % Wrist Snap
 B. _____ % Shoulder Rotation
 C. _____ % Elbow Rotation
 D. _____ % Trunk Rotation
 E. _____ % CM Velocity (Approach)

If you want to know more about the “Myths” of Coaching Volleyball, be sure to look for a CAP Webinar by that title on the [CAP Schedule page](http://www.usavolleyball.org) of www.usavolleyball.org.

ANSWERS: A= 2.1%, B=30.5%, C=44.9%, D=10.8%, E=16.7%
 *Other factors - lateral trunk flexion and error = (-4.0%)

It is too easy to focus only on what the players do wrong; make all efforts possible to ***point out what they are doing right***, or nearly right. ***Catch them being good!*** Keep the guideline of immediacy whenever possible. Teach players how to make judgments; ask many questions and help them judge what they are seeing.

Better Feedback vs. More Feedback - Remember, players have a limited ability to process information. They will only be able to process so much feedback; too much feedback may mean coaches are either wasting time, not letting their athletes “figure it out themselves” (“Eureka!”) or, in some forms of feedback, causing players to reach a point of “paralysis by analysis.” Constant instruction may take players out of the “groove” of practice, which is the track to optimum learning.

A key reason for coaches to help players to self-regulate their learning is by increasing their awareness of intrinsic feedback. ***The sooner coaches give the feedback and reinforcing comments after the action, the better.*** This is all part of speeding up the learning process, because it motivates the athlete toward self-analysis (“Eureka!”) and the achievement of correct performance.

Intrinsic Feedback is Best – There’s that word again! The information feedback from performance can help maintain the intent to learn for long periods of time. In other words, an attacker can see a ball hit their target, get past a block, shank off a digger, etc. Setting goals can help in keeping this intent, as well as providing good feedback. ***Intrinsic motivation encourages greater persistence.*** There are instances when coaches will need to direct feedback in order to help keep this intent. A blocker’s success is not always evident because the direct results (blocked balls) are not as frequent. In these cases, coaches must let players know when the block correctly did the job of channeling the ball to the defense, even though the player(s) may not have even touched the ball, much less blocked it.

Intrinsic feedback can be increased in many ways. Having athletes “freeze” in a position on command or perform the skill without the ball and their eyes shut can help increase their kinesthetic awareness and internal feedback. Players can also verbalize on each trial just after the skill is performed. A simple “yes” or “no” could be said in answer to success or failure in performing a “key” during the skill.

This same guideline has importance for coaches with regard to their positioning in drills and training. ***It is very important that coaches stay out of almost all drills so they are able to give positive feedback through both words and modeling, individually and specifically.*** Your job is to be a COACH, not just a ball machine! When coaches are involved in a drill, everyone must wait while they give one player feedback that is important only to that player. Remember, they will have to be performing the skills come game time without a coach’s presence on the court.

Marv Dunphy, former USA Men’s National Volleyball Team head coach, uses the terms “***precision praise***” and “***precision criticism***” when describing how specific feedback should be given. Too often a coach will say “*That’s it!*” or “*Nice job,*” which does not mean much to the learner. **BE SPECIFIC!** “*Way to keep that arm up!*” is the kind of coaching praise players should be hearing. Say, “*That’s it, _____,*” and fill in the blank with what “***IT***” is.

NOTES:

The vast majority of the things coaches say and do should be giving specific instruction to individuals or a group. In a study of the great UCLA coach John Wooden, it was found that **75% of his messages, both verbal and non-verbal, gave specific instruction**. 12% of those messages were requests to hustle, 7% were praises and 6% were scoldings.

Positive Wording - The subconscious does not register the negative in a phrase. A player who is told, “*Don’t serve into the net!*” is hearing and focusing on “*Serve into the net.*” Words must be positive, giving the player an image of what **should** be done. “*Don’t swing your arms,*” needs to be rephrased to “*Keep your hands by your waist.*” This small, subtle difference is just another part of combining self-control with the right focus.

Two very good questions coaches can be asking their players are, “*Did you look like the model (or goal or demo)?*”, and “*What happened?*” If coaches ask these questions after the players perform the skill or exhibit the desired behavior, so much the better. But they can also be asked after an error to make sure the goal is correct in their minds. **Keep modeling the behavior desired**, reinforcing it in the many ways available when observed and ignoring the errors they make (as long as they know it is an error).

Teach them the “Whys” - Tell players **why** coaches know things and players may not. Why is it that most coaches can get a tip shot by walking out from the bench, when the team on the court cannot get to the ball, even though they are much closer? Too many coaches then go back to teaching technique - rolling and diving - while still standing on the floor in front of the net and throwing the ball to players underhanded or flinging out hard-to-get shots.

Instead, coaches must **first check for understanding of the technique**, without the ball. If the athlete shows understanding then **focus on teaching the “when, where and why”** of what just happened in that play. **Too many coaches give feedback on technique, when in reality the error was made in reading, anticipation, timing, and judgment.** Coaches must help guide players to know **why** they knew where it was going, and more than that - train the players on the court to see, anticipate, time and judge the same type of play with the same type of ball - in the situation above, the tipped ball coming **over the net**.

One Key At A Time - Until the players are very strong in their basic skills, coaches must not tell them different things each time they give feedback. **Focus on just one or two things**; it takes time to modify anything. After giving someone information, walk away and help another player, coming back later when the player is ready for more information. There are plenty of others who need attention.

A coach’s attention is a powerful reinforcer and if used to reinforce what actions are wanted, the player and coach will be ahead in the long run. Too often, coaches run around reinforcing with their attention exactly what they do **not** want.

Feedback given will become positive reinforcement of the desired behaviors if coaches will **ignore the bad behaviors for the most part**. The feedback on what they are doing wrong should not be immediate and if not will then be less effective. It still should be very specific and positive (modeling and “*key words*”) so they have clear information as to what is to be corrected.

High Intensity = Less Information - **The higher the intensity of the drill, the harder it is for players to process specific feedback.** *Provide more general, reinforcing feedback in high intensity situations.* The lower the intensity of the situation or drill, the more specific the feedback should be.

Indeed, for most athletes, the match itself is a high intensity situation and thus, some specific “*bench*” feedback goes in one ear and out the other or may confuse them. During the competition, supply general feedback and positive reinforcement and ignore most of the errors. Intensity levels and feedback processing abilities vary individually, so the feed forward/information degrees may vary also.

Target Success/Teach Anticipation - Most coaches walk into the gym and turn on their error detecting “*radar,*” sweeping back and forth across the gym floor with probing eyes, paying attention to -- and coming up to -- athletes only after spotting an error. Then, with feedback on that error delivered, they return to radar mode, sweeping the gym for the next mistake. Instead, coaches must focus on looking for and giving feedback to errors in reading, anticipation, timing and judgment. The players already know the technique; they just do not know well enough yet **when** and **where** to apply what they know.

Coach on the Averages - Too often coaches make comments on one specific contact. If the comment concerns a safety factor in a skill, then the coach should not delay in making the comment. However, it is generally better for the coach and the player to watch four or more trials then make a coaching observation based on all of those contacts rather than the most recent one. This also allows the coach to give attention after good skill execution.

When commenting on the average of the past few touches, **coaches can give the player attention after a success**, while still focusing on the previous few, regardless of if the comment is about a good or bad habit. **Motor skill researchers know this as “summary feedback.”**

INCREASE THE OPPORTUNITIES PLAYERS HAVE TO RESPOND

At the beginning of the information feedback discussion this statement was made: *information feedback is generally viewed as the most important variable for determining learning, except for practice itself.* Practice trials are needed in order to have information feedback. There have been a number of studies that have shown that the number of times a player practices a skill (at an appropriate level of difficulty) is the best predictor of their improvement. So coaches should do everything they can to make sure that the number of practice trials, or the number of opportunities to respond, is maximized.

There are four main ways to increase opportunities to respond:

- **Skill warm-up.** Instead of starting each practice with a warm-up that requires the players to jog around in circles, start the warm-up with ball handling drills. The drills do not have to be intense; they can be at a level that will allow gradual warm-up. After this game-specific warm-up, then coaches can add stretching activities to guard against injury. The 10 minutes or so that the players have devoted to ball handling will give them an advantage over those teams that have been running around in a circle for that same time.
- **Tutoring.** Tutoring is an activity where the coach and one, two, or three players work together in a session designed to practice a specific skill. Because there are only a few players at a tutoring session, each player obtains numerous opportunities to respond and, receives a great deal of good feedback. Virtually every practice can be preceded by a tutoring session, and it doesn't hurt to end every practice with a similar session.
- **Small groups.** It is true that a certain amount of practice should include six-on-six game-like drills, but when players are playing six-on-six the number of chances they have to touch the ball is diminished. It makes sense to schedule a number of small-group games, like doubles or triples. Generally if a team of twelve players is divided into three games of doubles, they will play the ball three times as often as when they are playing six on six.
- **Wash games or in-a-rows.** Bill Neville and Doug Beal devised many different types of practice situations in which their players had to win two or sometimes three, four, five or more rallies in a row. The routine was as follows: every time a ball was served and the rally terminated, a coach would immediately throw another ball into play. If the objective was to win two in a row the team that won the first rally would also have to win the second rally. If the first team was successful on the first ball and then the other team was successful on the second ball, then no points were scored and it was called a “wash.” It is possible to set any number of “in-a-rows” as the goal, so if the goal is to win five in a row, then after the serve, four balls would be thrown into play one after another (as long as the same team kept winning the rallies). ***In this system, with all of the extra balls thrown into play, there are a much greater number of opportunities to respond.***

For novices to become experts, the main difference is in experience. Simply put, each coach should look to **give more game-like contacts in the same amount of time.** Train more often with **smaller groups**, using **two or even three balls per court.** **Use both sides of the net** to split your training groups in half, if space does not permit giving each group a court. **“Wash” drills give more touches** (about 20-25% more than just scrimmages) in the same amount of time.

NOTES:

A beautiful example of this method can be found in an article about teaching a child to fish by Engerbretson (*Parents, Kids & Fly Rods; "Fly Fishing"* magazine, Aug. 1979). Dr. McGown paraphrases this article a little to make these ideas apply to volleyball. McGown states:

"Remember, too, that children learn best by imitation; that is, by watching and doing, rather than by long, involved, technical explanations. A discussion of horizontal momentum, optimum jumping angles, force conversion and so on could as well be given in a foreign language for all the good it will do most spikers. The majority of instructors talk too much. Show them what to do. Even the simplest jump is made up of many components, and it is usually a mistake to try to emphasize all of these at one time. A beginner cannot mentally concentrate upon timing, the footwork, the jump, the arm-swing, ball placement, the contact, and the recovery simultaneously. Therefore, after the child has been given a general introduction to spiking, it is best to concentrate on only one component at a time. For example, have the child do a complete spike, but concentrate only on the footwork at the end of the approach."

Don't worry if the rest of the spike isn't exactly right; just emphasize the last two steps. Then, as that particular component becomes a fixed habit, start to concentrate on another aspect of the spike. The rule then, is let one thing become a habit before moving on to the next.

Some Final Thoughts from Bill Neville

On "Principles" vs. "Laws": "*Principles*" refers to guidelines - with thought. "*Laws*" are absolutes - meaning no further research, study, is required.

*The more I work with this the more I do believe in transfer. However, my definition is a bit different. I've discovered that people with athletic experience understand **how to learn** and **prioritize key information**. I like Peter Vint's example of the baseball player and the wrestler - and completely agree. The general motor program of throwing certainly lends itself to the **application** of hitting. Likewise, a wrestler (who never has thrown objects other than humans) who is enlightened by the opportunity to play volleyball, needs to focus on learning how to **spike** over learning how to **throw** - but throwing instruction certainly wouldn't hurt. However, the wrestler also brings an aggressive, competitive mindset, knows how to learn and how to apply athletic skills.*

*I think there is one absolute: **there aren't any** - other than natural laws (the effects of gravity, rain is wet, etc).*

I think we must focus on explaining or defining for new coaches the terms and applications of blocked, constant, variable, and random practice; the importance of guiding principles and keys (chunking information and 4x4 cues); and the importance of positive, reinforcing feedback (verbal and non-verbal). I also think we should promote and live by two very sound principles:

- 1) "**Simpler is Better**", and
- 2) "**The Game Teaches the Game.**" (also be loosely translated as, "**Players teach players how to play - Coaches guide the process.**")

ADDITIONAL RESOURCES

⇒ If you want to read more about the volleyball topics below, or others related to this chapter, download and print out the articles found at www.usavolleyball.org under the Resources tab, then click on the Education/IMPACT/Articles links.

- [Canadian Sport for Life Long Term Athlete Development Model \(LTAD\)](#)
- [Volleyball Canada LTAD Model](#)
- [USA Hockey American Development Model \(ADM\)](#)
- [Sample Learning Styles Inventory](#)
- [Full article – Motor Learning Comments and Observations](#), by Peter Vint and Bill Neville

Also look for the following in your local library or on-line:

- *The Talent Code*, by Dan Coyle, Bantam Books, 2009.
- "*Parents, Kids & Fly Rods*", Engerbretson, "*Fly Fishing*" Magazine, Aug. 1979.
- "*A Working Model of Skill Acquisition with Application to Teaching*", A.M. Gentile, *Quest* 17:3-23, 1972.
- "*Reading the Play in Team Sports – Yes, it is Trainable!*", Dr. Damian Farrow, Australian Sports Commission's *Sports Coach* Magazine, Vol 27, #3, 2004. Portions reprinted here with permission.
- "*Perceptual Expertise in Sport: Some Myths and Realities*", Dr. Mark Williams. **Published in The Dawn of the New Millennium: Proceedings of the 10th World Congress of Sport Psychology**, Editors A. Papaioannou, M. Goudas and Y. Theodorakis, Thessaloniki: Christodoulidi Publ., 2005.
- *Motor Learning and Performance: Principle to Practice*, 3rd Edition, Schmidt, Human Kinetics, 2004.