DIG IT WITH SARA

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New Mexico Spring Coaches Clinic
April 7, 2018

Presentations:

Maximizing Reps in the Gym
Applying a Growth Mindset

Maximizing Reps in the Gym

I. What can we do better?
   a. Don't necessarily coach the way you were coached
   b. Finding opportunities to apply science to learning
   c. Need to change the mindset that blocked training provides results in the coaching community.
   d. As soon as your athletes understand the skill, move onto the application in game-like decisions.

II. Warm-Ups
   a. Laps -> play volleyball to warm up!!!!
      i. Full Court Shuttle
      ii. Tennis (younger kids)
      iii. 3 Person Pepper (if you only have half court)
      iv. 2v2 Skinny Court or "Beach" court (2/3 of the court instead of half)
         1. Non-dom hand, 2 contacts, must hit
         2. For younger kids (less than 9 or 10), they can catch the ball, then do the skill.
         3. Linear ranking tournament.

III. Technique work
   a. Digging
      i. With a partner – have them dig forward or dig on an angle, Never back where the ball came from.
      ii. Groups of 3: Hit, then run forward to set. Then dig. Dig stays then hits. Better than standard 2 person pepper.
      iii. Over the net with someone digging next to them as well (teaching responsibility of ball)
   b. Passing
      i. Rapid Fire Passing. Can be done by any age. Modify as needed.
      ii. OOS passing with libero
      iii. Half court passing on angles with setters
   c. Setting – have passers passing the ball to the setter instead of tossing to the setter. Or toss the ball from other places (RB especially) instead of just MB
   d. Hitting
      i. Spend a significant amount of time in OOS swings.
      ii. Hitting off of live sets
      iii. Deeper than the setter drill (4v4)
   e. Serving
      i. Serve, base, chase.
      ii. Don't let servers get balls from a ball cart to serve with… doesn't happen in a game!

IV. Team Drills: Emphasis on kids initiating as much as possible or making the games replicate the game. Drills to start with a serve if possible. Our game always starts with a serve. I don't necessarily follow this all the time, but I am aware of it and try to do this when possible. Keep a faster pace since you have more kids on the court.
   a. Cheap
   b. Moneyball
   c. Penalty Box
   d. Big 7, Little 3
   e. Variation Scoring
   f. Dig or Die
   g. No Fly Zone

Resources

Dig It With Sara:
www.digitwithsara.com/coachingclinic

Volleyball Coaches and Trainers Facebook Page (VCT):
www.facebook.com/groups/volleycoaches/

IMPACT Manual Supplement on Motor Learning Research:
https://www.teamusa.org/-/media/USA_Volleyball/Documents/Education/Resources/IMPACT-Resources/Full_Text_Motor_Learning_Article_-_Vint___Neville.pdf

Linear Ranking Tournament Document:
https://medinavolleyball.wikispaces.com/file/view/Linear+Ranking+Tournament+04.pdf

Team Drills

I keep a copy of these drills on the back of my practice plan.

Cheap

6v3 (or more). The 3s side is the "CHEAP" side and is only allowed to send the ball over on the 1st or 2nd contact (encourage them to be cheap and mean… the harder the ball they send over, the better they're chances are of winning the rally). The 6s side is trying to score on a cheap ball (usually cheap balls are defined by us as balls sent over on the 2nd contact to deep corners, tipping, etc. We all know *those* teams…). 6s side cannot tip/dump in front of the 10 ft line. CHEAP side gets +2 for CHEAP kill, +1 for 6s errors. 6s side gets +3 if they are able to convert a cheap ball to a kill using all three contacts. Play to 15.

Moneyball

6v6, 5v5. There are a lot of variations of this game (also called Vegas). Play out 5 balls with an initiated downball. Whatever the final score is after those 5 balls (5-0, 4-1, 3-2, etc), the side that has the higher score gets a "moneyball". A moneyball is usually a chaotic ball that requires them to run, dive, joust, dig, etc. If they win the moneyball rally, they keep their points. If they lose, it's a wash. You can also have the other side keep their points if they win the moneyball instead.

Penalty Box

Dodgeball + Hockey! 6v6. If a player makes an error, they are put in the penalty box. The only way to get them back into the game is if their team does a specific task such as a kill. Balls are tossed into the winning side and the winning side sends the losing side a freeball on the first play (that way, losing team gets the first ball, but it's more game-like because it's not off the coach's toss). When a team gets down to 1 player, the coach will give them the ball to do a pass to self, set to self, and swing over the net. The only exception to the send if over on the 1st ball rule comes when there is 1 person on the court. If the team that has 1 player on the court is able to get a kill, the remaining 5 players come back on the court.

Can modify as needed based on skill level. A favorite with the younger kids.

No Fly Zone

Set up an area of the court in the deep middle back where you do not want players to attack to. If a ball lands in the box, it's out. Can move the area for whatever you want to work on (avoiding the libero, put the area on the LB side, etc).

Variation Scoring – play to 50

6v6, 5v5 (with a no-fly zone) Can be any of these sort of rules, or make your own based on what you're working on. You can have as many rules are you want per round. I like to stick to two or three, or else they forget. Can be done with an initiated down ball to the other side OR with serving + free balls.

Different scenarios:

A) If setter gets a dig to kill: 5 points /If setter has digging error: +10 points
B) If RB gets a kill: 5 points / If Middle gets a kill: 5 points / If Setter gets a dump: 10 points
C) If middles get a stuff block: 5 points / If middles get a kill: 3 points / If RS gets a kill: 2 points / If LF gets a kill: 1 point
D) If _____ gets a dig to kill (someone other than her): 5 points / If you win the rally by putting the ball in RB/LB corners: +5 points
E) If you get a kill on a 2nd ball attack: 5 points / If you run a Wave, 31, or and get a kill: 5 points

DIG or DIE (5v5) no middles

<u>One team receives free balls or down balls from a coach **for entire game**.</u>
Rally scoring. If the ball hits the ground without being touched by the block or digger, that team loses all points. Thus, the score can be 7-1 and if the ball lands untouched on the side with seven points, the new score is now 0-2. Play games to 8 points and then rotate and sub.
*** Can also apply dig or die rules to other games (if a ball hits the floor during a different drill, they go down to 0). If you have younger kids doing this drill, you can say that they have to make an attempt on the ball, but not necessarily get a touch on the ball.*

Secret Squirrel

Teams race to complete a set of three tasks (i.e. stuff block, combination play, setter dump). The coach initiates play with a downball and continues to alternate downballs until one team completes their tasks. Neither team knows what the other team must accomplish. But as the drill progresses, an attentive squad can determine what their opponents are attempting and defend accordingly. To assign these secret tasks, the coach can either verbally indicate the assignment or have teams draw from a customized deck of task cards.
My secret squirrel cards can be downloaded on my website.

BSBH (Ball.. Setter…Ball… Hitter)

6v3 (3s side: setter, hitter, Lib). Games to 20. Can also add additional hitters on 3s side. Do not play it out after 6s side completes the rally.

<u>3s side gets a points for:</u>
+1 swinging kill
+2 roll shot kill
+3 tip kill
+4 setter dump

<u>6s side gets points for:</u>
+1 proper read and attempt
+2 proper read and attack but out of bounds
+3 proper read and attack in, but hits the tape.
+4 proper read and attack in but doesn't hit the tape.

Full Court Shuttle Drill

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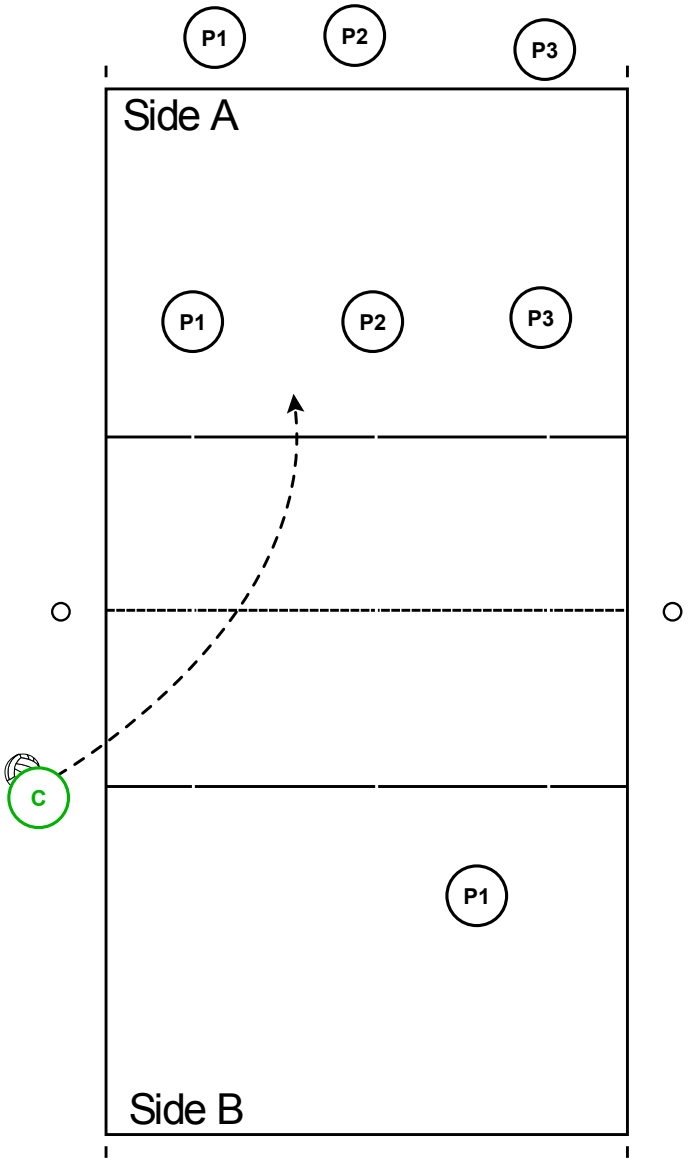
Warm-Up



Coach initiates the drill into Side A. Side A does 3 contacts (pass, pass, pass over). After each P passes the ball, they will run to Side B and touch the end line and enter into the drill to play the ball sent over.

When the drill dies, reset with 1 P on Side B.

Other variations:
-Coach tosses ball to P1 for them to free ball it over.
-Add setting and hitting (when I do hitting, I usually start with 2 players on Side B).

Dig Forward, Set

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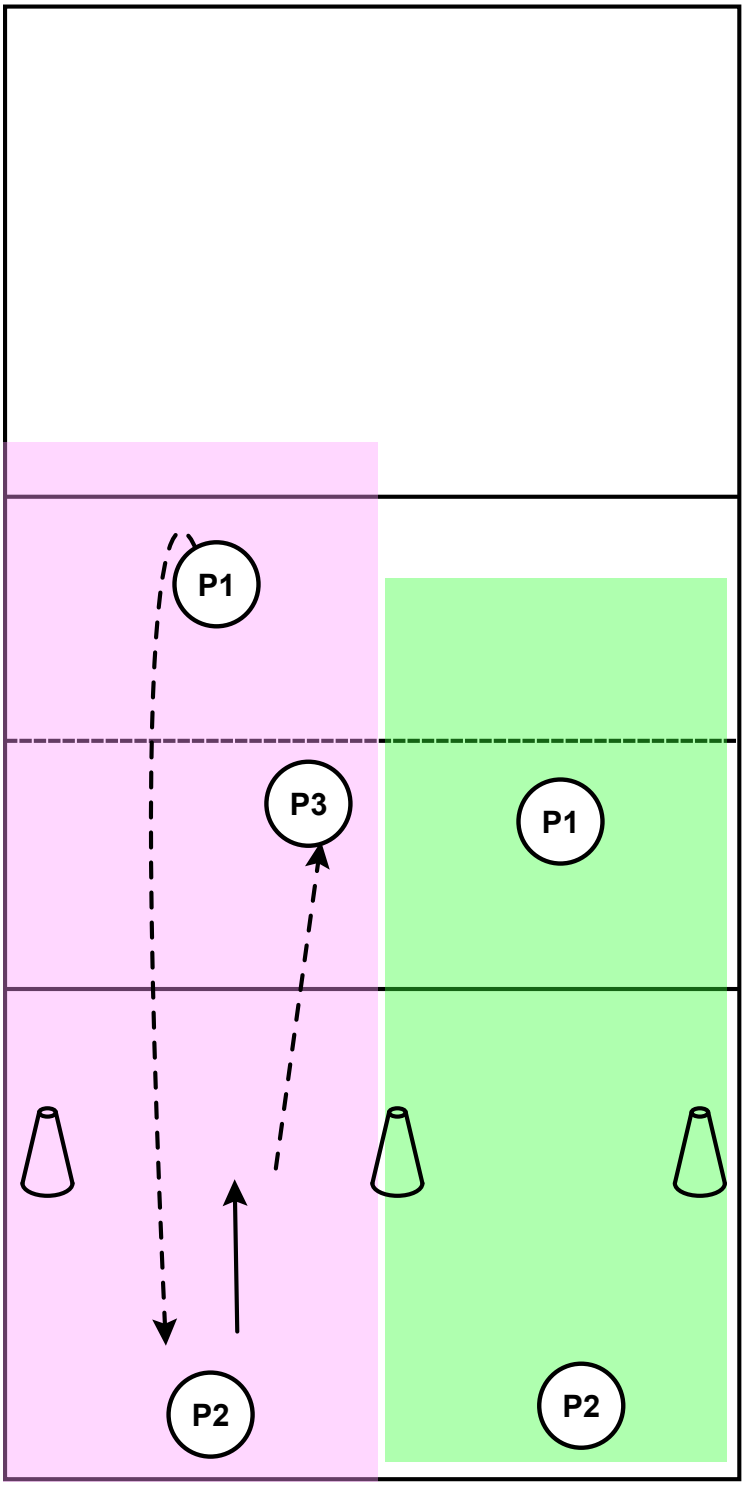
Warm-Up



P1 hits the ball to P2. Digs forward toward the cones and passes or sets back to P1 or P3 if going over the net).

Butterfly

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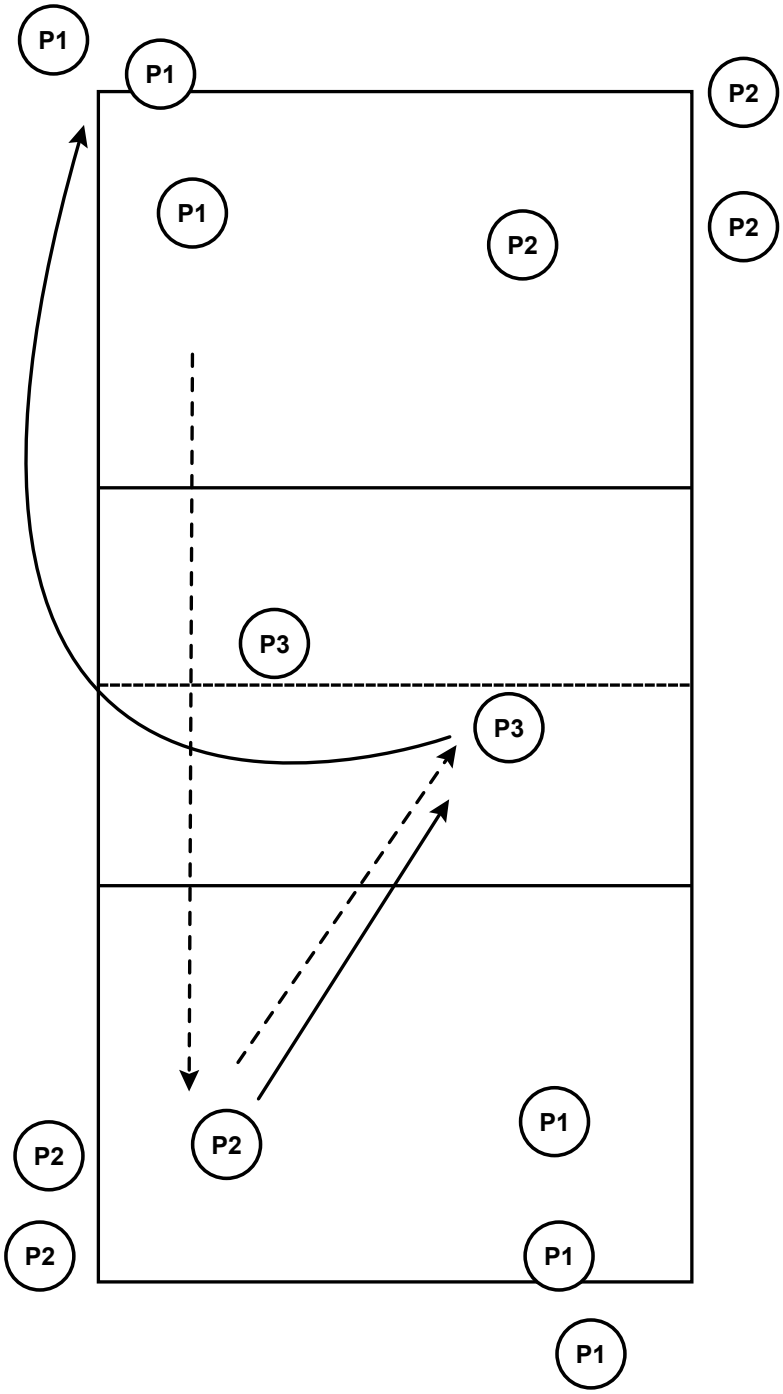
Warm-Up



P1 serves or throws into P2. P2 passes to P3. P3 goes to serve as P1.

Variations: Have P1 dig after serving. Add blockers after P3 spot. Add a permanent libero in MB.

Rapid Fire Serve Receive

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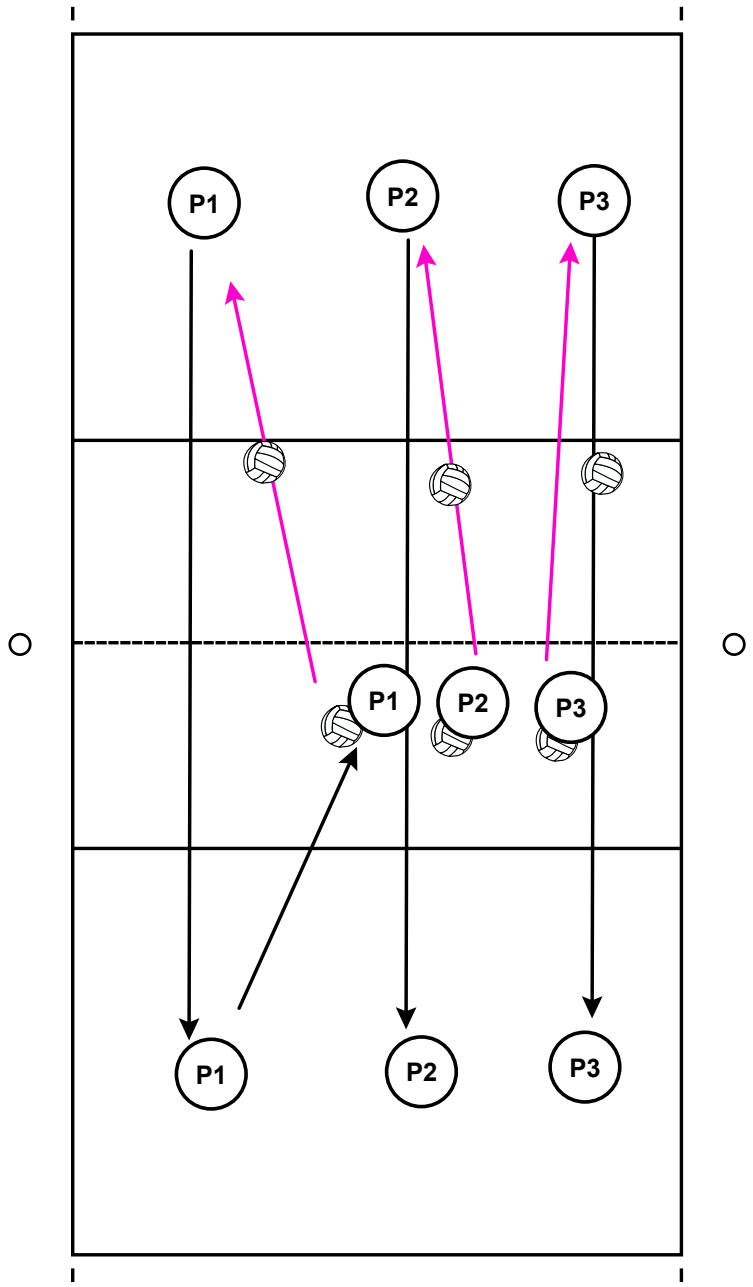
Passing



Groups of 3 (or 4), 2 balls: Player serves or tosses ball into their passer. Passer passes to their target. As soon as the ball is served, the target at the net is bouncing their extra ball over to the passers.

OOS Hitting Drill

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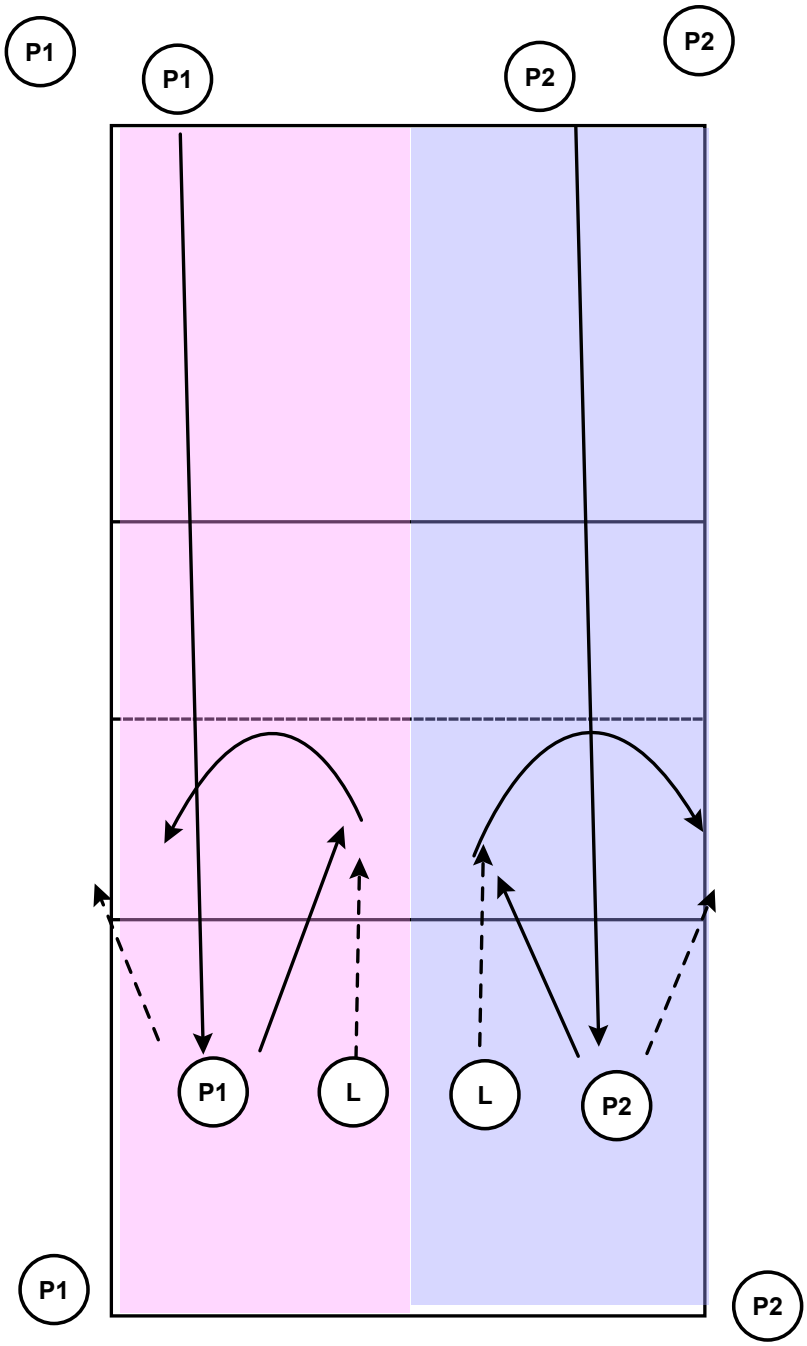
OOS, passing, defense, serving, attacking



Pass to attack in OOS (out of system). If P1/P2 take the first ball, the L will set them an OOS ball to their sides. If L takes the first ball, then P1/P2 will put it over on the 2nd contact. Rotate on your side of the court then switch sides.

3 player angle passing

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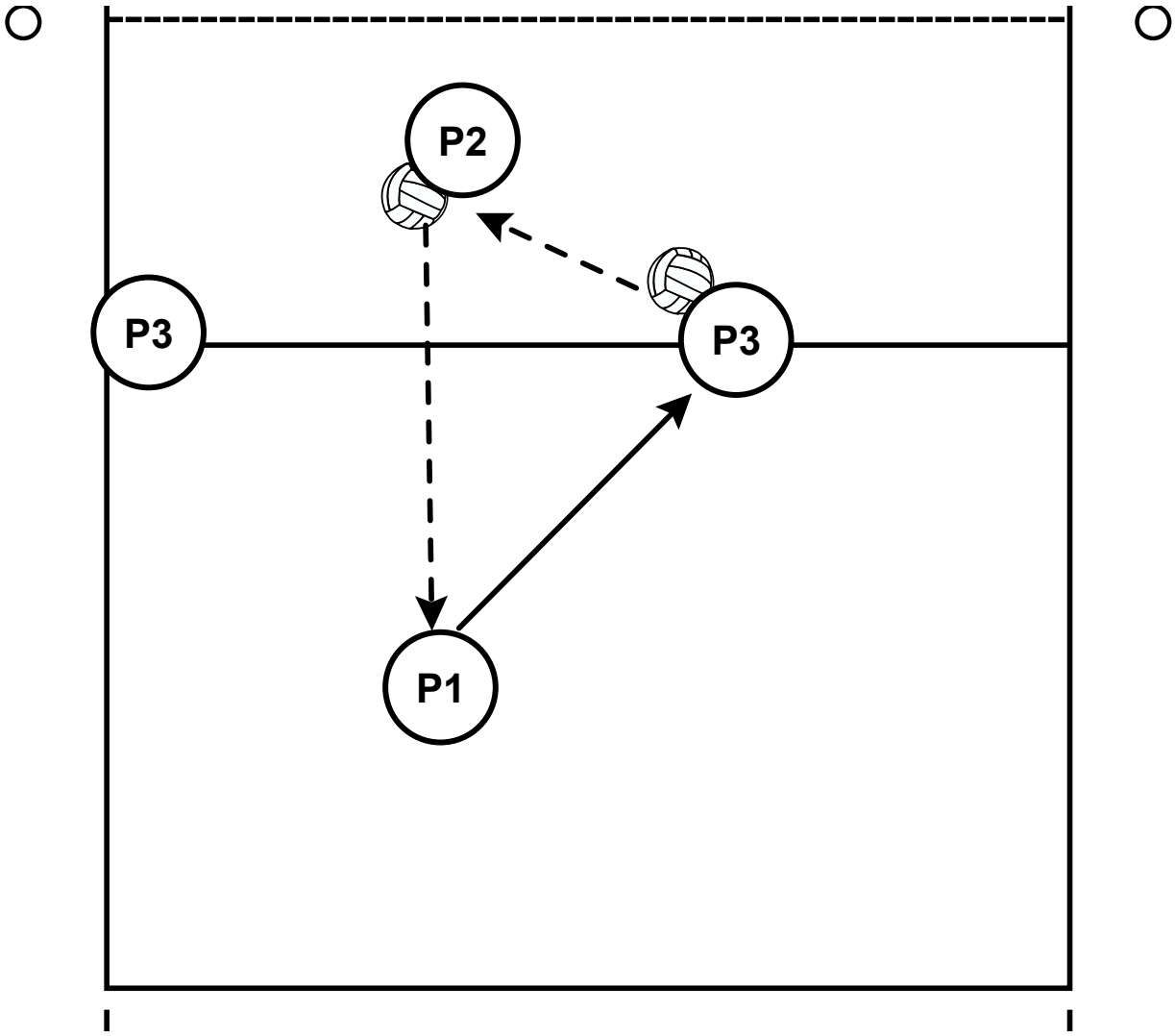
Ball Control



P1 passes on an angle from a tossed ball to P3. 2 balls make the drill run efficiently. As soon as P2 tosses the ball to P1, P3 will bounce the ball to P2 right away.

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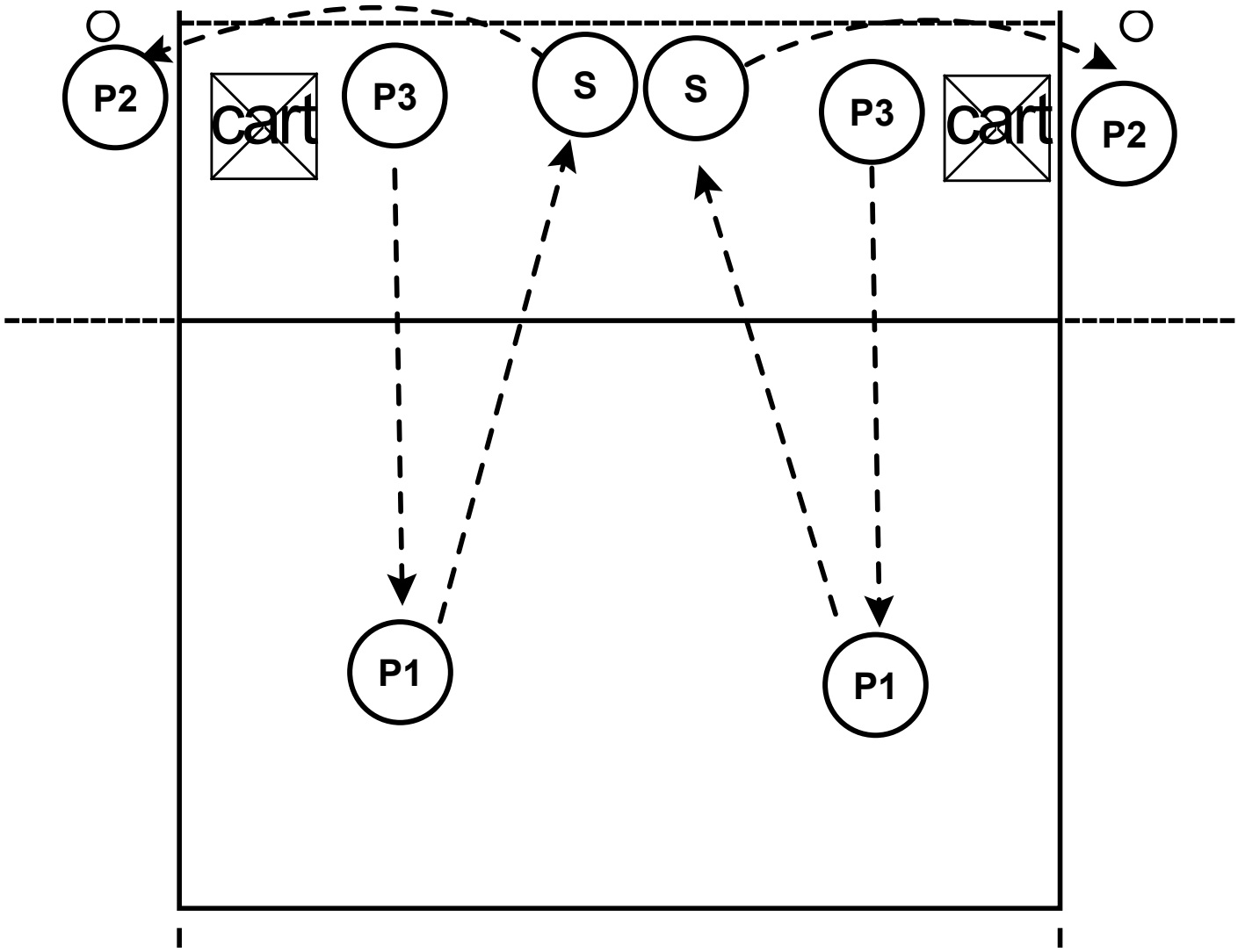
Passing



Line Reception

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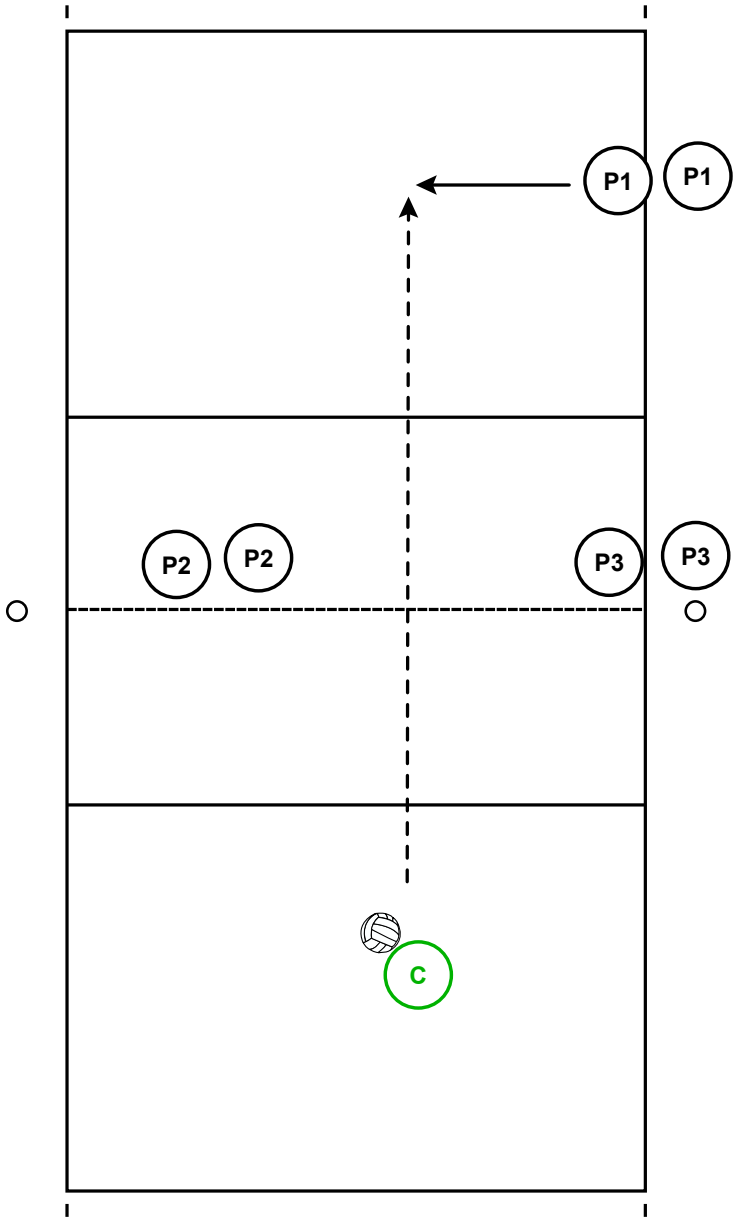
Passing



P1 shuffles toward middle back and passes the ball to the target spot (P2). You can add P3 on the outside so P2 can set.

P1> P2> P3 > shag and back to P1

Defense off boxes

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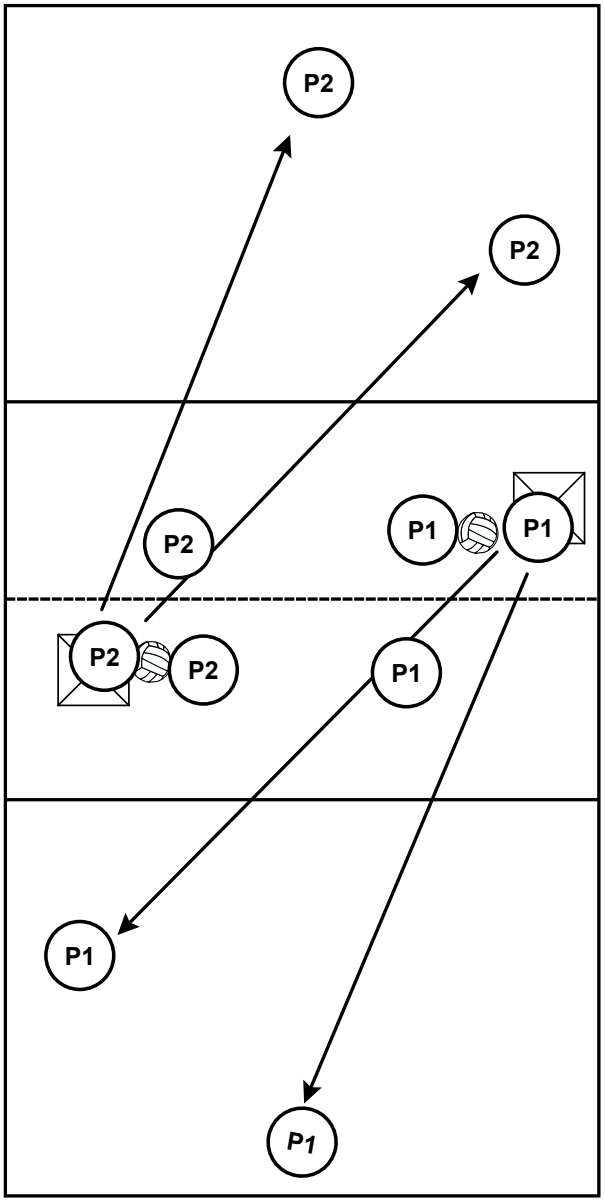
Defense (Team)



Groups of 5 or so. One player is on a box hitting to their teammates on the other side. Diggers try to dig to target. You'll need at least a target, hander to the player on the box, and 1 or 2 diggers. Go relatively quickly to maximize reps.

4v4 Speedball

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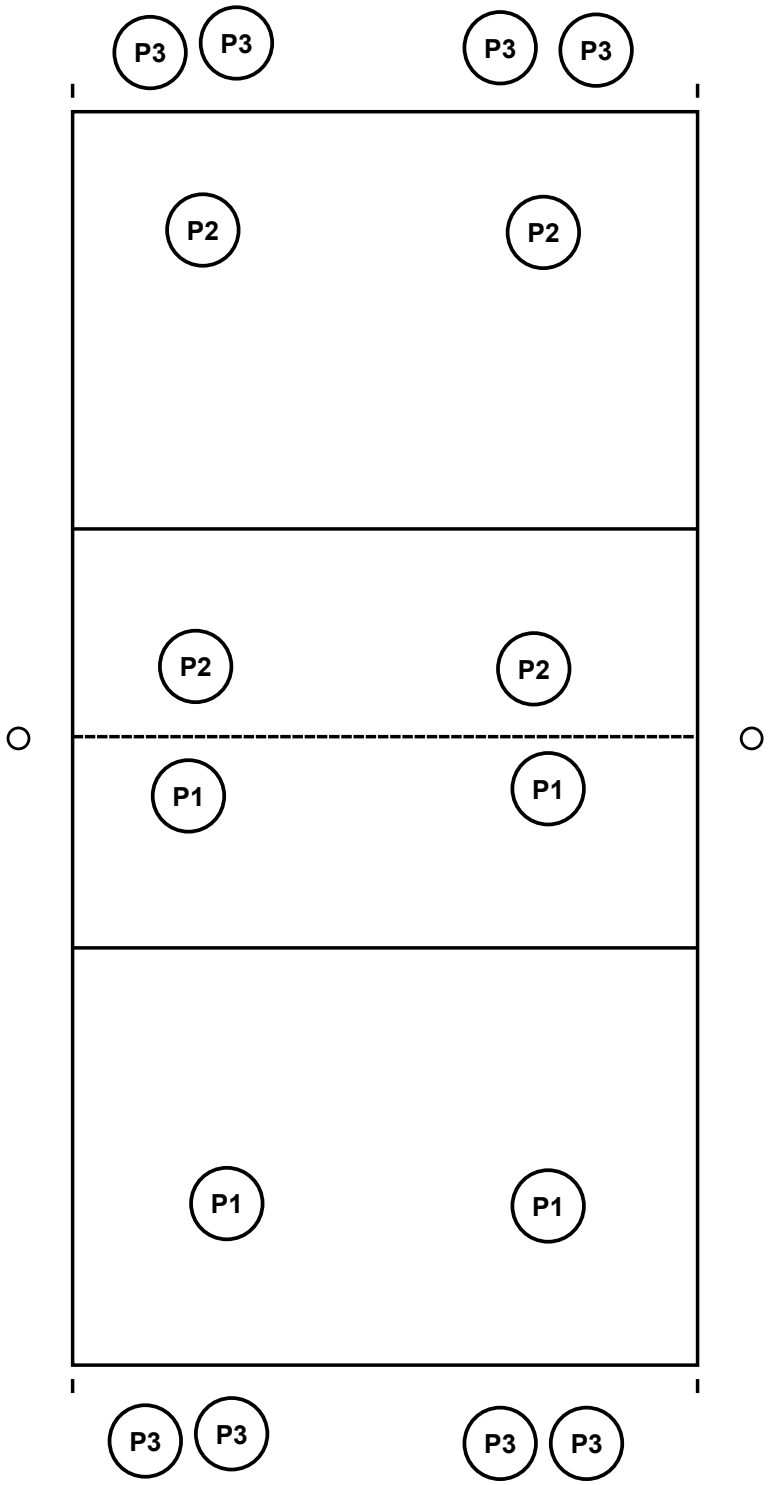
Small Group Play



Drill can be initiated by a serve, a toss, or a toss from the side of the court.

Deeper than the Setter

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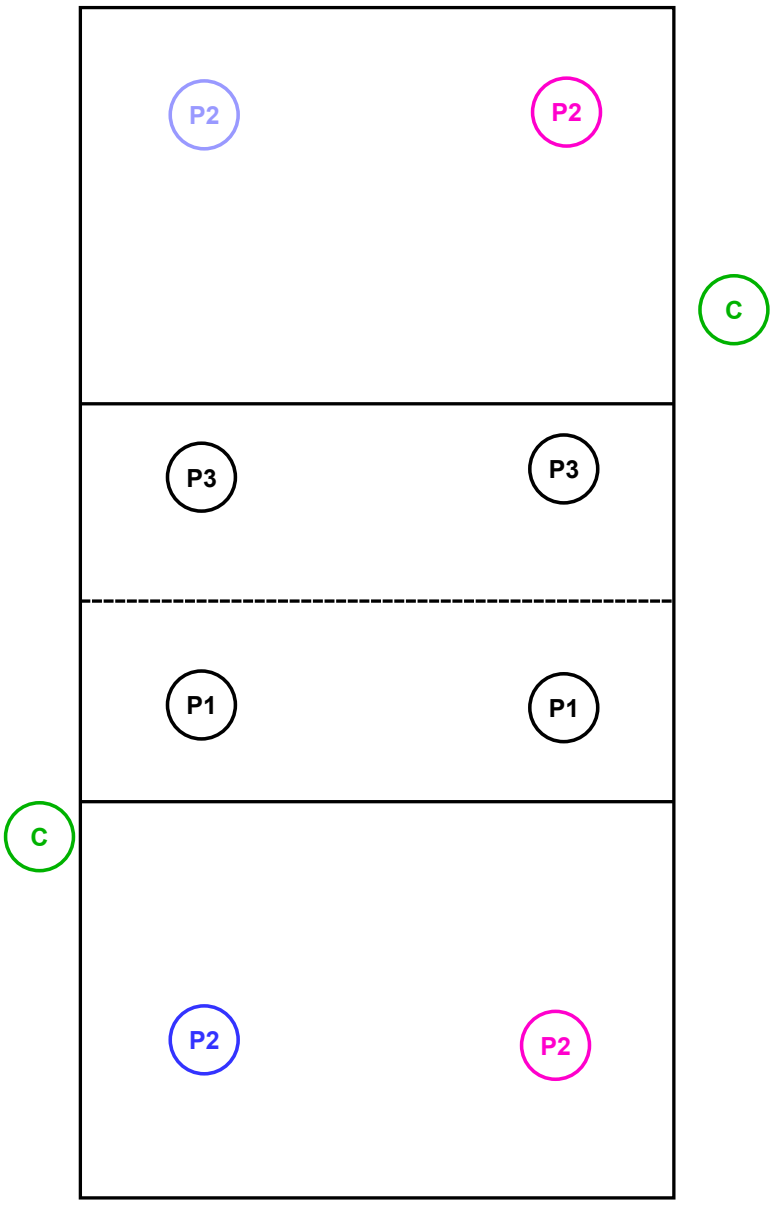
OOS



Players in the front row MUST get behind the player setting or bump setting in order to stay on the court. Setters are either of the 2 players in the back row. Can go cross court to set or have hits from from the RS hitter. Can be initiated with a serve like Speedball).

Promoting False Confidence

BY **JOHN KESSEL** | **NOV. 07, 2016,** 3:45 P.M. (ET)

How can we avoid creating false confidence in players?

Start by asking yourself this simple set of short questions. How often have you seen anyone teaching the other nets sports NOT using the net? Have you ever played/seen the teaching of table tennis from the same side of the net? Badminton? Tennis or pickleball?

In my experience, I have never seen any Olympic level coach on down teach their net sport from in front of the net; except volleyball. Some of you might have seen a rare situation in tennis, which has such a large court surface, but I have not. That includes four years of watching my son in tennis practice. Watch the tennis/table tennis and badminton greats at the Olympics warm up before any match, and you will see them cooperatively hitting, over the net.

The net is "regulatory stimuli" that governs the actions of players. It is something that, once you hit 13U in girls volleyball, you will have to be hitting over for about 50 years of play. Yet most coaches drill a huge amount of time without it. If you create it in ways that allow for hitting over it (like the USAV four nets on a rope, or a ribbon or rope) there will be coaches who cannot understand what you are doing. They may scorn the use of such nonperfect nets. Let's keep thinking about regulatory stimuli in our sport.

Regulatory Stimuli	False Confidence
Net	Partner passing/pepper
Antennas	Tossing to players
Ball flying over the net	Same side of net
Lines	Playing without any in/out judgement needed
An opponent competing against you	No opponent to read

Regulatory stimuli is a cornerstone of the principle of specificity. Yet in the interest of making things look better in practice, coaches add gimmicks and training devices, eliminate the realities of the game, and break the game up into drills that are not game-like, but easy to do, like partner or circle passing.

This need for drills builds into the false confidence as the player can do the drill successfully, but fails when the specificity and reality of the game then return in the match. This past decade, one of our national team head coaches was told by an Olympian: "I need to do work on my setter/hitter timing." Coach replied "We have been playing for two weeks, if you think that needs work, what are you waiting for?"

From a recent **Coach Your Brains Out (http://coachyourbrainsout.podomatic.com/)** podcast (check their site for great discussions with some of our sport's best thinkers) my friend and mentor Dr. Carl McGown said two things to ponder. 1. He quoted Brent Rushall, another esteemed motor-learning scientist, *"Coaches persist however in violating this basic principle (of specificity) with dubious arguments, false premises and distortion of facts."* 2. He said about pepper, *"… somehow, we want passing back and forth near the net to be helpful, but it's not."*

Why do people do this? Because that's how they were taught, and it "worked." The tradition of not using the regulatory stimuli of the net has resulted in the promotion of a huge amount of pair ball control done on one side of the net as well as repetitive wall passing, blocked and coach-controlled drills, machines, gadgets and many other ways of "training" that do not transfer or teach the realities of our sport.

The net and antenna, plus the ball and court lines, are *regulatory* in the things learned in volleyball. We must follow their rules. The basket/backboard, ball, and court lines are regulatory for basketball. Coaches would never train the game flow and shooting shots without a hoop or backboard (just shooting into space and pretending it was good). Yet volleyball coaches constantly train without the reality of some sort of net. It is easier that way as no net "gets in the way" or forces the truth of what the contacts actually are like.

Good coaches do more than just develop volleyball skills. They develop the whole person, physically and especially mentally. Our sport's uniqueness starts with the remarkable lack of time the body is in contact with the ball – averaging under 5 seconds per match, per player. So over an hour of match play, what are your players doing for the other 59 minutes and 55 seconds of competition?

This leads naturally to the No. 1 skill in our sport being reading (aka anticipation or volleyball IQ). Also, every first ball (aka serve) and no less than third ball (hopefully an attack) having to clear the net. The false confidence of pepper takes that difficulty away, stealing quality contacts from players every time.

Tossing by the coach (and also slapping the ball, another coaching skill in our sport's traditions that does nothing for reading) right to the player is another way we develop false confidence. In the interest of form/technique, we put thousands of balls right to the player who then thinks they can do the skill, only to find out in the match that few, if any, balls come right to you. Instead of hitting, we throw, stealing the chance to read the reality of the actual skill. We have spikers hitting off of tosses or even worse, a ball in a machine.

We falsely develop the confidence of setters setting off of tosses that arrive right on their forehead from a ball cart in the zone 5/6 seam that never moves. These setters spend 95 percent of their REAL game time moving and running to the ball to bump set, run through, call help, or set anywhere in the court but the actual spot they have been training in for years.

The picture in this paragraph shows the actual contact points in the most recent Olympics by a setter from Iran who many say is the most deceptive and skilled setter in the game. Every world-class match has this bell curve of setter contact points (off of world class serve receivers), yet we put setters in one spot and block-train tens of thousands of sets that don't happen all that often at ANY level.

We have millions of players who can confidently partner pass, and hit off a toss. Yet when a REAL served or set ball arrives, they struggle with when and where to do the technique as the ball is not close to them. Young players may pair pass hundreds of times in a row, then forget their skill when they get out onto the court in a game. In fact, they haven't learned the skill of reading or moving, because of partner passing. In front of friends and parents, they cannot serve receive at all.

Often, they don't even move to the incoming ball because they have learned that their partner pass teammate will hit it right back to them. Too often, it is passed directly back to them by a teammate, when in the game, it is driven hard over the net by an opponent, and away from them. They pepper well, but are flummoxed in the game when they pass the ball too tight, or over the net.

Even at the highest level the problem persists. U.S. Women's National Team Coach Karch Kiraly has the focus point of “Dig UP and OFF.” We have players who spend months saying “sorry!” when they hit a ball not right at a partner, who must want to say to an opponent in a match “hey, that is not right at me!” Players should not be saying “sorry” when it is not nearby. They should say, “dig that!” It is our fault as coaches that we seek to develop the players' “technique” without the constraints that will exist in the actual game.

See this 5-year-old? He can do the core passing technique. That means the ball “knows” the angle of his arms. Perhaps his feet could be more staggered or balanced, but as you can see, his “teammates” are learning good campfire defense. If you put the ball right to him, he can perform, even if it is a camera shoot. What he can't do YET (an important word for coaches as this blog shows) is do it in reality at game speed. He doesn’t know how to read so he can move sooner. This same bafflement is seen at all ages when moving from pair-passing confidence to dealing with over-the-net failures. All ages suffer from the physics of our game; the ball must rebound. Five total seconds of contact per match is a reality. They cannot read the flying ball in time to be at the right place at the right time.

Better is faster, which is developed over countless hours of game play, with experience being a core key to success. In one skill, serving, an Olympian and a 13-year-old can deliver the same serving speed. Some nations deal with this by restricting younger players to serve a maximum of five points in a row. Canada uses a form of competition called “triple ball” for 13U, where each point is actually a served ball and two thrown balls. Game-like ways of training at gradually increasing speed by first using a balloon, then a beach ball, then a light ball, allow a player to learn the technique of reading in a real way.

When players are not taught the at least 1/3 power that comes from the shoulder turn/torque in serving, we again fall back on developing false confidence by moving new or younger players up into the court, “so they can get it over.” Those coaches steeped in technique and winning get players to learn an underhanded serve, rather than teaching them a serve that will transfer more effectively to the overhead serve that the majority of players do. A torque (or roundhouse) serve, as used by more than one third of the players in the world, fully integrates the power that comes from torquing. There are also coaches who take advantage of this step in modification, and have good servers blasting away from much closer to the net. Yet another example of developing false confidence, this time by seeking the outcome (winning) over the process of serving from the actual endline, which is less accurate and more challenging.

We want to prepare for anything, so we need to limit some things we do. We coach to play not drill. Small-sided games for new players or other ways to contain a whole game are great solutions for building real confidence. This learning in reality does not look pretty at the beginning, and for younger players it is true chaos. The coach's enthusiasm over progress, not the outcome, is essential. Still, just like you learned to ride a bike, you learn by making mistakes. Want to get a sense of that learning by error and mistakes again? Take this weekend to learn to ride a unicycle, and see how many times you err. This specificity in learning a motor skill is seen wonderfully in this classic video about learning to ride a “backwards” bike (https://www.youtube.com/watch?v=MFzDaBzBlL0). You know how to ride, but when things are flipped, well, you simply do not know how to ride a backwards bike is all, and it takes time to learn it.

I love to teach the game to ALL, from 5 years old to 75. We have this wonderful sport for a lifetime with true teamwork that is fun. So when non-elite players join me, I want them to love the game, not some drill. Special Olympians, senior citizens and picnic volleyballers may just play volley-tennis, not three-hit skill development. This one-touch mentality results in a unique situation in our sport, where at the lowest level the worst team (who hits any and every ball over the net on one hit), usually beats the better team (who is working on three contacts). For athletes who get time to practice, and do not want to win on single-hit balls going over the net, they need to play three-hit

volleyball by doing three-hit volleyball. No matter what their age, they can superhero, superhero spike; not hit coach throws or partner passes. We MUST change the Exploratorium of learning that the gym is, to be the most effective in performance enhancement. This comes from playing doubles as a pair option (that takes four people in reality), or superhero/superhero/spike partners, or 2 vs 0 (BEACH (https://www.youtube.com/watch?v=Q9ZXmjIDhtw) example -- YOUTH (http://www.teamusa.org/USA-Volleyball/Video/2014/11/12/USAV-Drill-Video-2-vs-0) 10U example) , or wall options that are game-like (http://www.teamusa.org/USA-Volleyball/Video/2013/12/13/USAV-Drill-Video-Game-Like-Wall-Practice) – but not from the current way most pair up.

We need to build real confidence by training in reality and using regulatory stimuli as much as possible so players habits and skills are valuable to the way they will play the game.

Comments

About

Resources

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 are 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

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-receive, 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 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.

By: Vicky Grooms Denny, Ph.D.

AVCA Coaching Volleyball Magazine, June/July 2010

Applying Motor Learning Principles in Coaching Volleyball

Part II

By Vickie Grooms Denny, Ph.D.
Chair, Department of Exercise and Sport Science &
Head Volleyball Coach
Clearwater Christian College

Coaching volleyball is enhanced when coaches draw from a variety of disciplines to aid in the teaching of skill development. In the last issue of Coaching Volleyball the following five motor learning principles related to teaching volleyball skills were discussed:

Principle #1 – The Practice Conditions Should Be Like the Game
Principle #2 – The Practice Conditions Should Provide For Variability
Principle #3 – Learning Occurs in Three Distinct Stages
Principle #4 – Consider Transfer of Learning When Teaching New Motor Skills
Principle #5 – Focus Attention on the Movement Effects Rather Than Just the Movement

This is the second part of the series, summarizing five additional principles from motor learning research and making application for coaching volleyball. Using these principles will allow players to reach their full potential in learning and developing volleyball skills which will lead to more effective performance on the court.

#6 – Feedback is Essential for Skill Learning

Perhaps there is no more conclusive evidence in motor learning literature than the effectiveness of feedback to enhance skill acquisition. In addition to task intrinsic feedback, which is provided through the senses of the learner, augmented feedback provides additional information helping the learner acquire the desired skill performance. A coach providing appropriate augmented feedback to the player regarding the performance of a skill is very helpful. Augmented feedback may come in different forms such as a coach providing verbal feedback. For example, when the coach remarks, "You served 8 of 10 balls in-bounds in zone three," this type of augmented feedback is called knowledge of results. While KR is often redundant with task intrinsic feedback, it may be needed when task intrinsic is not available or is unclear. Another type of verbal feedback is knowledge of performance. KP is when information is given regarding the specific characteristics of the performance. For example, a coach using KP informs the hitter that she dropped her elbow prior to the spike. This type of verbal information is descriptive knowledge of performance, as the feedback "describes" the act, and is recommended for more advanced players. For beginners, prescriptive KP is more effective such as telling a beginner to keep their elbow high when spiking. Besides verbal feedback, other examples of using augmented feedback include video tape recordings and movement kinematics such as the Dartfish software program.

#7 – More Is Not Always Better

While feedback is extremely beneficial in skill acquisition, more is not necessarily better. In fact, asking learners to rate their own performance before providing augmented feedback may actually enhance the feedback's effectiveness and help players not become so dependent on the coach providing all the feedback. There are numerous ways to decrease the amount of feedback provided, helping players become independent learners. For example, having players perform several attempts of a skill before providing augmented feedback (called summary feedback) can allow them to engage in a cognitive/kinesthetic skill analysis before hearing from the coach. A method called self-selected feedback suggests players only receive feedback from the coach, when the players request feedback. Another approach of providing less rather than more feedback is termed "bandwidth feedback" which entails establishing an acceptable range or criterion of performance error, and only providing feedback once the player is outside that range. These approaches for reducing feedback delivery are helpful for coaches and players since it is a systematic reduction of feedback based on individual skill levels. So while feedback is essential for skill learning, more is not always better.

Principle #8 – Consider Organization and Complexity When Practicing the Whole Skill or Part of the Skill

Perhaps no other motor learning topic is debated as much as the whole/part practice question. When practicing a volleyball skill, which is type more effective? To practice the entire skill or to practice parts of the skill? One way for volleyball coaches to solve this dilemma is to conduct a skill analysis for each of the six volleyball skills (serving, passing, setting, hitting, blocking, and digging) and determine the complexity and the organization of each skill. The complexity of the skill consists of the number of parts or components while the organization of the skill involves the relationship among the various parts. If a skill is highly organized, it means that one part is dependent on the previous components. After doing the skill's task analysis, the general principle is if the skill is high in complexity and low in organization then the part method is better. For example, serving in volleyball would involve several components or parts to the skill, but these parts are not interdependent to one another; so the part method would be more appropriate. However, when a skill is low in complexity and high in organization practicing the whole skill is more appropriate. For example, spiking in volleyball involves parts that are highly dependent on one another. The approach, jump and arm swing all work interdependently in order for the entire skill to be successful, thus the whole method is more appropriate, and this is especially true when working with beginners. The whole/part debate will continue among volleyball coaches, but determining the complexity and organization of the various skills may provide some guidance regarding which practice approach is better to use during practice skill instruction.

Principle #9- Practices Should Be Short and Frequent

This principle relates to mass verses distributed practice schedules. A mass practice schedule will have fewer practice sessions than a distributed schedule and will be fewer in number, while a distributed practice schedule will have the same amount of time allotment, but across more sessions making the sessions shorter in length. For the majority of volleyball coaches, decisions regarding the amount of practice time may or may not be within their control, but how long each practice is, and how often the team should practice are legitimate concerns that need to be addressed. The motor learning research suggests that practices can be too long and not as productive as shorter practices, so when in doubt, go for a shorter practice session, rather than a longer one. If more practice is needed, add additional practice sessions instead of lengthening the specific practice schedule.

Principle #10- If You Want To Get Better at Playing Volleyball, Play the Game of Volleyball

The final motor learning principle for coaches to remember repeats the first tenant presented at beginning of this series. Since repetition aids learning, this critical principle needs repeating; practice like the game. The best practices increase skill learning that can be transferred to the real game setting. During practice, if coaches increase time on game-related skills and increase opportunities to learn the skills in the context of the game, players will get better at playing the game of volleyball. Remember when volleyball coaches had players passing, setting or spiking against the wall during practices. The question no one asked was "how often during the volleyball game will passing, setting, or spiking against the wall be necessary"? Many of our practice drills do not simulate the game conditions. It has been stated that the best passing drill is a pass/set/hit drill; the best setting drill is a pass/set/hit drill; and the best hitting drill is a pass/set/hit drill. In other words, if you want to get better at playing the game, then play the game. For volleyball coaches this means designing drills to simulate the same skills needed in the game. If it isn't game like, don't do it. Always be analyzing practices, changing drills, and incorporating mini games, wash drills and controlled scrimmages, so that practice looks like the game of volleyball. If you want your players to get better at playing volleyball, then let them play volleyball.

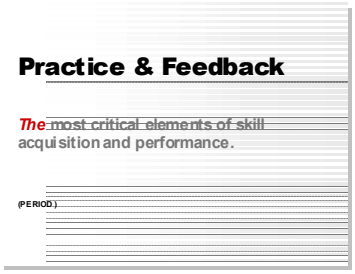
Effective volleyball coaches work hard to enhance the performance of their players. Information from various disciplines such as motor learning can help assist them with this process. This article looked at five additional principles from motor learning literature along with applications for teaching/coaching volleyball skills. Although certainly not exhaustive of all motor learning concepts, these principles do provide a solid pedagogical foundation for coaches developing successful players and effective teams.

Getting Better

best practices for your best practices

Peter Vint, Ph.D.
United States Olympic Committee

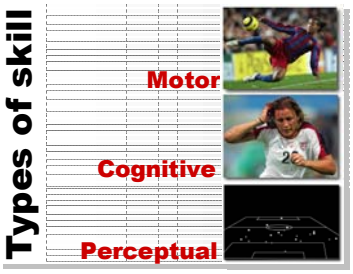
There are exactly two things which contribute more to the development of skill and human performance than anything else. These two things are **practice** and **feedback**. Without one, the other is ineffective and in some cases can be completely useless. And, it is important to note that not all types of practices and not all sources or methods of delivering feedback are equally effective. My talk today was designed to provide you with the most relevant, up-to-date understanding of how you can apply the most established principles of feedback and practice design to maximize the development of the athletes you coach.



Skill and Skill Development

I define skill as an ability that has been developed by practice, training or by experience (which likely includes both of the former). From the research (and perhaps from common sense), we know that skilled performers tend to demonstrate focused, goal-oriented behavior; they improve with practice (and they practice "deliberately"); and they actively seek and can effectively use feedback to improve performance.

While these definitions may seem pretty benign, it is also important to recognize within any given "skilled performance", there are at least three important types of skill that may come into play: motor skill, cognitive skill, and perceptual skill. And, like *any* skill, each may be improved with practice and feedback.



Motor skills are probably the most familiar to us. These skills include the physical acts of doing things in our sport: running, dribbling, passing, shooting, heading, diving, punting.

Cognitive skills include things like managing stress, visualization, and the development of tactics and strategies that we'll use during a performance or over the course of a competition. Cognitive skills would include the development of a plan to help deal with increased pressures or unfamiliar environments.

Perceptual skills include the ability of the athlete to perceive, detect, and identify cues and characteristics of the environment in which they are performing. Doing so allows skilled performers to more quickly and accurately make decisions. Essentially, we can think of perceptual skills as "field or games sense". Perceptual skills include things like identification of postural cues or movement patterns which may indicate an impending action. They also include our ability to recognition patterns, trends, or tendencies, particularly in consideration of game- or player-specific situational probabilities.

For an excellent introduction to the ideas and research behind perceptual and visual search skills, see the work of Dr. Mark Williams. I recommend, in order:

Williams, A.M & Grant, A. (1999). Training perceptual skill in sport. International *Journal of Sport Psychology*, **30**, 194-220.

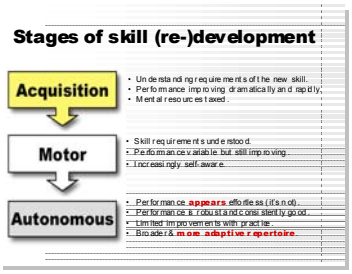
Williams, A.M. (2000). Perceptual skill in soccer: Implications for talent identification and development. *Journal of Sports Sciences*, **18**, 727-750.

Williams, A.M, et al. (1994). Visual search strategies of experienced and inexperienced soccer players. *Research Quarterly for Exercise and Sport*, **65**, 127-135.

Taken together, we should recognize that to perform at progressively higher levels, we must become more effective at developing and integrating each of these types of skills into our overall performance and performance development programs.

An important point here. My guess is that many of you have considered these skill components in the context of the athletes you train. However, consideration and development of these skills is equally important for coaches and program organizers. And, this is true for the remainder of the

presentation. Anything that applies to the development of skill of athletes, also applies to the development of skill of coaches.

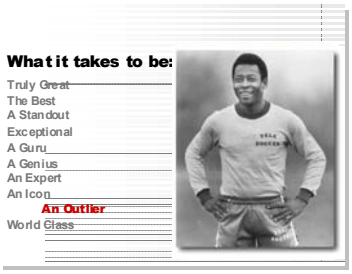


There is considerable disagreement in the literature as to the exact processing and learning mechanisms that contribute to the development of skill. However, most researchers acknowledge that three general phases of skill development can be identified: the acquisition phase, the motor phase, and the autonomous phase. Despite the (unfortunate) use of the word "motor" here, note that the stages of skill development seem to apply for each type of skill: motor, cognitive, and perceptual.

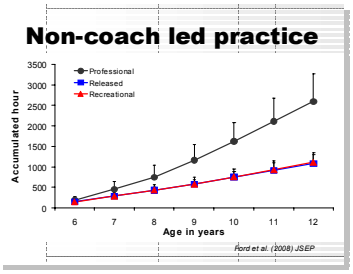
In the **acquisition phase** an individual is simply trying to understand the requirements of a new activity. An individual in the acquisition phase is still learning the task and has low levels of task specific proficiency. Performances are slow and inaccurate. In addition, mental or cognitive resources are limited because the individual must continuously process the activity requirements in their working memory.

The second phase, the **motor or compilation phase**, recognizes that the individual has a (more) complete understanding of the task requirements and performance improves. In this phase, proficiency in the activity has increased but processing requirements still dominate working memory. During this stage, performance improves rapidly but can be inconsistent as athletes explore different and progressively more efficient ways to execute the skill. Subtle changes in timing, tempo, or situation may result in significant disruptions in performance. Athletes in the motor stage also become more adept at picking up on internal and external cues that serve to further guide performance improvements.

During the **autonomous phase**, which is considered the last step in the development of skill, performance has reached a level where it *appears* to be effortless, where performance is almost always accurate, and where additional practice seems to make little additional improvement. In this phase, the activity seems to be performed automatically and cognitive processing requirements are low thereby freeing up mental resources for other activities. While performance in this final phase is typically referred to as "skilled", it is important to recognize that each phase represents a different level in the continuum of skill development.



So, what then does it take to become really, really good at something? To become an expert? To be the best in the world? The answer may not surprise you as you've heard it here before: feedback and practice. And lots and lots of it. How much? Research from decades of work on expertise and expert performance put the total number of accumulated practice hours necessary to achieve this status as somewhere around **10,000**. This is not a hard and fixed number, but one that has manifest itself in areas as diverse as music, chess, mathematics, and sport.

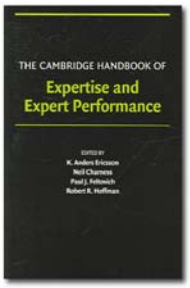


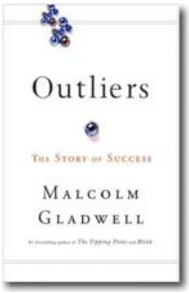
Importantly, it is not IQ, early precociousness, genetics, or "natural ability" that accounts for exceptional human performance. It is accumulated hours of what Dr. K. Anders Ericsson refers to as "deliberate practice". This is the kind of error-focused, hard, effortful work that only those who are supremely motivated to excel will do. Included in this time is the time spent away from organized coach-led practice. In fact, recent work has demonstrated that one of the strongest differentiators among young athletes who later went on to become professionals versus those who did not achieve that level was simply the number of hours spent playing pick up games or "street soccer".

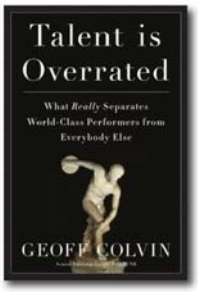
As a brief aside, I'd like to mention that there are a number of outstanding resources available on the topics of expertise and expert performance. The contemporary guru in this area is the aforementioned Dr. Ericsson. His masterwork, "The Cambridge Handbook of Expertise and Expert Performance", compiles a vast array of the most comprehensive, up-to-date, state-of-the-art research on the subject. This past year has also seen three new books published in the mainstream media. Each has something to offer and I'd recommend them strongly. If pressed for a favorite, I would offer Dan Coyle's "The Talent Code: Greatness Isn't Born. It's Grown. Here's How.".

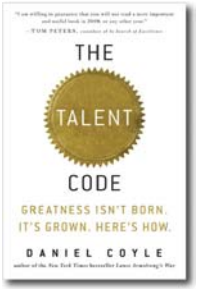
Dan Coyle maintains a very interesting website in support of his book. The site includes videos and descriptions of other talent hotbeds and as he describes it, "deep practice".

http://www.thetalentcode.com





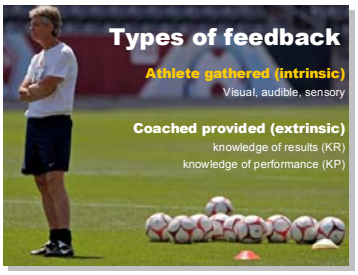




FEEDBACK

By way of a general definition, feedback may be described as information about a performance outcome or result and the factors responsible for it. This information may come from many sources, and in order for feedback to be utilized effectively, it is important to understand what those sources are and what kinds of information they may provide.

First and foremost, it is important for us to understand that athletes themselves have access to a great deal of information directly. The literature calls this "intrinsic" feedback although I find it effective to describe this as "athlete gathered" feedback. Our athletes can see, hear, feel, smell, and taste. And, believe it or not, most of them were born with the ability to do this all on their own! They likely know before you do whether they struck a ball solidly or imparted the intended trajectory and spin.



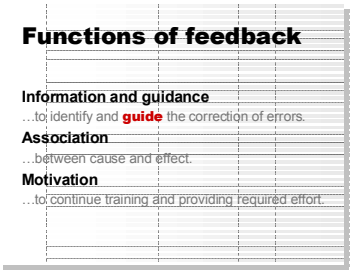
Extrinsic, or coach provided, feedback is that which that is external to the athlete and therefore is or must be supplied to them by something or someone else. Although applicable to both intrinsic and extrinsic sources of feedback, two terms: knowledge of results (KR) and knowledge of performance (KP), are most typically described in the context of extrinsic feedback.

KR describes information about the result of the performance with no real reference to how the result was achieved. In soccer, examples of KR may be the result of a pass or whether the passed ball was properly brought under control. Note that the athlete will almost always have access to this information as well, and for KR to be utilized effectively, the coach should limit themselves to providing information about the result that was not obtained by the athlete directly.

"Knowledge of performance" or KP represents something quite different. KP provides information about *how* the result was actually achieved. Here, the coach may have much more useful and/or accurate information than the athlete about things like technique, timing, or other elements that cannot be easily observed or perceived.

Now that I've introduced what feedback is and what types of feedback are available to the athlete and coach, it is useful to discuss what feedback actually does and why it is so important to the development of skill.

Feedback provides at least three important functions.

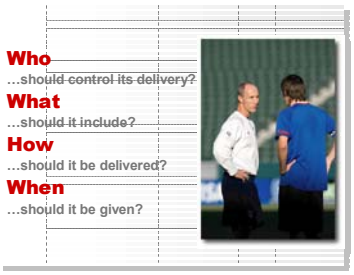


1. **Information and guidance**: Feedback provides information that can be used to identify errors and guide improvements in performance.
2. **Association**: Feedback can be used to create associations between stimulus and response. That is, feedback has the potential to help the athlete develop an understanding of cause and effect. "If I strike the ball to the left of center, the ball will bend to the right".
3. **Motivation**: The motivating effects of feedback are well documented and when properly integrated into a training program, can help athletes pull through long or challenging training blocks or fight through periods of apathy or uncertainty.

The important thing to bring up at this stage is that while we can appreciate how feedback can have powerful and positive effects on our athletes, this exact power can also be the downfall of using it. In a way, feedback can be almost drug-like in that your athletes can become dependent upon it. It can become addictive. The problem comes when the feedback that has been so heavily relied upon becomes unavailable. If, for example, an athlete is so accustomed to getting feedback from their coach after each set piece in practice, then if this becomes unavailable during competition, the performance of the athlete will greatly suffer.

With this in mind, the remainder of this presentation focuses on how to use feedback appropriately and how we can design practices that complement and not defeat its appropriate use.

Suffice it to say, the scientific and coaching literature is packed with research and anecdotes about feedback. In this literature, you'll encounter dozens of hypotheses, "paradigms", and a jargon all its own. But, when all is said and done, all of this work can be addressed in the context of four simple questions:



1. **Who** should control feedback?
2. **What** should the feedback include?
3. **How** should feedback be delivered? and,
4. **When** should feedback be given?

Who. Who should control the delivery of feedback?

Research has shown convincingly that when athletes seek and can control the content and delivery of feedback, performance improves. However, in the real world, this result is affected strongly by the experience, maturity, and skill level of the athlete as well as by the complexity of the skill being performed (which itself may be relative to the experience, maturity, and skill level of the athlete).

What we can tell is that novice performers will likely need and will take better advantage of feedback when delivered (appropriately) by the coach. More experienced performers should be encouraged to think about and understand their own performances and the information that can be derived from them so that they eventually need less and less coach-controlled feedback.

The goal here is autonomy. Self sufficiency. I often say, somewhat tongue-in-cheek, that the job of a coach is to make him or herself obsolete. In reality, there will always be critical functions for a coach to perform and new athletes to work with. But, the point of my message should be clear: athletes should be active, involved, and knowledgeable in critical self-assessment of their own performances.

There are, however, a few issues that should be considered when encouraging athletes to seek and control the delivery of feedback.

1. The feedback should be accessible. If an athlete wants to review game footage, they should be able to get into the video room. They should also be able to use, without stress or excessive training, any associated equipment.
2. The feedback should be understandable. Whatever information the athlete is seeking and using, it should be easily understood and correctly interpretable.
3. The feedback should be actionable. That is, based on what information the athlete uses and how it is interpreted, they must be capable of acting upon it. Implicit in this statement is a consideration of the time frame over which any change is intended to occur. This is important and should be discussed directly between coach and athlete to establish and manage expectations.
4. The feedback should be compatible. Video and other sources of feedback can be excellent ways for coaches to help athletes understand that the feedback you provide and what they sometimes feel/interpret are not always aligned. Say an athlete tends to miss too many shots on goal high. You state, "you're leaning back too far". The athlete counters, "no I'm not". The videotape confirms your view and a correction can be made. However, if the opposite should ever happen (the athlete is actually correct), you may have an issue on your hands.

What. What should feedback include?

Recall that athletes can usually and directly gather (intrinsic) feedback about the results of their motor skill performances and in some cases, how these results were achieved. With this in mind, *useful feedback should include specific information the athlete cannot gather or accurately interpret on their own.*

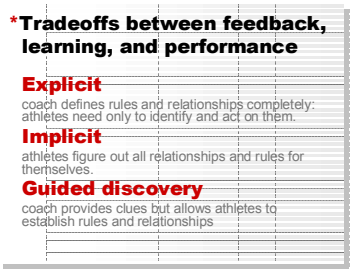
Regardless of how it is presented, *feedback will only be impactful if it contains information on something that actually contributes to the performance outcome*. This implies that the coach must have some level of prerequisite knowledge of the factors *known* to influence the outcome of the skill being performed and assessed. *The feedback must be limited to factors the athlete can actually control or modify*. The time frame allowed as well as the sensitivity or malleability of the factor(s) needing modification must be considered.

Effective teachers and coaches are those who understand that not all learners are the same but somehow find a way, using different methods for different learners, to impart their knowledge and instill their lessons. With this in mind, cues, analogies, and anecdotes can be effective ways to deliver your message with relevance and meaning.

Last, increasing the precision of feedback can be useful to more experienced athletes. And, these athletes seem to demonstrate a sort of filtering ability whereby they can "round down" from higher levels of precision without any additional difficulty. I am sure there are limits to this, but in general, more experienced athletes can handle more precise feedback (note that I did not say "MORE", I said, "More Precise").

How. How should feedback be given?

While brilliant, the video segment clearly provides an example of a coach going way over the top with communication. Too much. Too fast. The effect on his athlete is likely to be "paralysis by analysis". So, how do we avoid this? While communicating with your athletes is likely to be very much tailored to the individual, some robust guidelines regarding the delivery of feedback are provided



As discussed, any of these styles may have use for coaches and performers, alike. However, when evaluated in the context of retention and learning, implicit and guided discovery are far superior. Guided discovery has an advantage in that the time required for learning may be shorter than an implicit approach.

I have been told by reliable sources that JC Anderson performance this segment in exactly one take. Now, *that's* impressive (and clearly the result of some effective practice)!

below.

Limit your cues and feedback phrases to "7 ± 2" chunks of information. Cues and key word phrases should be short and effective. "7 ± 2" pertains to our ability as humans to process information. The rule states that people can effectively handle 5 to 9 bits of information. What's a bit? Well, it depends. It can be described as a chunk of information that may comprise a single number or letter or it could involve a lengthy sequence of letters or phrases. The most salient aspect of this is to be specific and concise: Specificity is important. But, so is brevity.

As an example of the 7 ± 2 rule, think of how you first learned your SSN (or worse, your spouse's). At first, you probably tried to memorize each number as a separate element. 9 bits. Then, you probably grouped them as they are grouped on our cards (by design, by the way, as are our phone numbers). The first three numbers become one chunk; the next two become the second chunk; and the last four numbers become the third chunk. Notice that you've gone from 9 bits of information to three chunks. Last, of course, you may have memorized the entire sequence effectively storing this as one meaningful chunk of information.

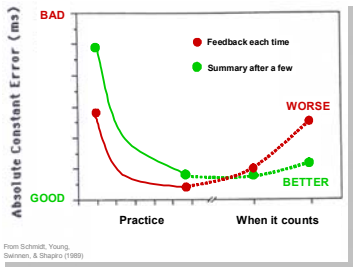
Word your phrases in the affirmative and keep them action oriented. Use statements of the form, "do this" rather than "don't do that".

Encourage active learning and estimation. Ask your athletes questions. Work with them so that they can progress from being passive recipients of your feedback to active diagnosticians then insightful prognosticators of their own performances. In all cases, work to ensure that athletes do not become dependent on your feedback. Feedback should be presented in ways that encourage the athlete to see, hear, feel, and interpret things for themselves.

When (at last). When should feedback be given?

The traditional view on feedback is that immediate and frequent is best. After all, what better way to fortify the associative role of feedback? In some contexts, research has in fact shown this to be true. However, the superiority of frequent and immediate has been largely limited to situations involving novice performers and complex skills. Frequent and immediate feedback is also usually associated with improvements in performance during early stages of skill acquisition. However, as we'll see later, performance during "acquisition" does not always carry over to performance when it really matters most.

What research has shown is that delaying feedback (making it *not* as immediate), reducing the frequency of feedback, and providing summaries of several performances instead of feedback after every performance tend to lead to better long-term performance. Stated different, it improves learning and retention.



Modifying the delivery of feedback so that it is provided more frequently during the acquisition phase and is then "faded out" as performance becomes more proficient is more effective than giving more feedback consistently (and frequently) throughout practice. Similarly, the idea of providing feedback only when the performance falls outside of a certain 'bandwidth" (think "range of correctness" or "range of acceptable performance?") leads to better performance than more frequent and uniform feedback schedules.

Before I summarize what we've discussed so far, I'd like to take a few minutes to talk about the important process of prioritizing feedback. We're probably quite adept at identifying several things in any given skill that we'd like our athletes to improve. Say you've identified 10 such things. You know it is neither appropriate nor effective to introduce feedback on all 10 things at once. So, from all the information available to you, how do you sort through these 10 things and prioritize them so that maximize the performance of your athlete? Here are guidelines I like to use:

There are a number of approaches for identifying critical features. While beyond the scope of this presentation, I advocate a method called "deterministic modeling". This method and others are nicely described in "Qualitative Analysis of Human Movement" by Duane Knudson & Craig Morrison.

Critical features first: Identify factors that truly influence performance and focus only on those factors which are sensitive to training or maximize improvement

Account for relationship to previous actions: Recognize that some faults may in fact arise from others. For example, poor decision making (and the associated perceptual skills) can often lead to breakdowns in motor skill performance. Which

skill needs work?

Consider time frame/difficulty required to affect change: We all know that some changes are harder or take longer to realize. For example, it takes considerably more time and effort to improve vertical jumping performance than it does to correct a simple posture or technique flaw. This may have some value when trying to prioritize between-season vs within-competition feedback.

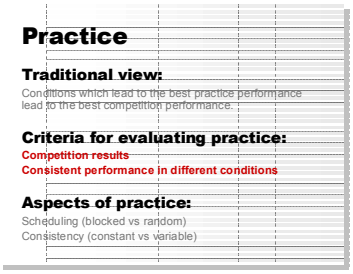
Do not discount motivational effects of goal setting and achievement: Easier to accomplish goals can enhance motivational aspects and improve the likelihood of being successful with more challenging aspects of performance.

Here are some take home points on feedback that what we've discussed so far.

- When ready, provide athletes opportunity to control delivery of feedback.
- Provide feedback athletes cannot obtain or interpret correctly themselves.
- Encourage athletes to "estimate" their own performances. Help them become (and stay) independent and able to self-assess.
- Be concise and specific with cues and phrases. Remember: 7±2. Provide feedback and instruction in affirmative, action-oriented phrases.
- Provide feedback more frequently early, less frequently later. Consider delayed, reduced frequency, summary, and bandwidth feedback.
- Provide feedback to maximize learning and competition performance.
- Prioritize feedback on performance-affecting factors and so it can be acted upon in the time frame considered.

PRACTICE

Now, we'll switch our attention to practice. The long-held view on practice is that conditions that result in the best practice performance will also result in the best competition performance. And, for a long time, research tended to support this idea.



However, when we begin to think of the criteria against which we should evaluate the effectiveness of our practices, we begin to see some real challenges to this assumption. Specifically, when we assert that we should really evaluate the effects of practice, NOT by performance in practice but by performance during competition, we really begin to see some differences. Also, when we look to see how practice affects our athlete's ability to generalize their performances in different competition conditions, we see again that what works great in practice may not work as well when it counts.

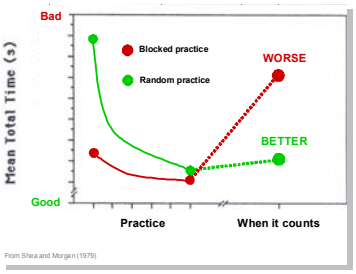
There are only two aspects of practice that I want to touch on today. Scheduling and Consistency. Let's look at each of these.

BLOCKED VERSUS RANDOM PRACTICE

Blocked practice is what we associate with simple drills. We ask our athletes to repeat the same task or play time and time again until they've had a certain number of repetitions or have done something for a set amount of time. If you are a golfer and like to practice at the driving range and hit 20 balls with your driver and then 20 balls with your 7 iron and then 20 balls with your 3 wood, you are doing blocked practice.

Dr. Richard Schmidt is credited with this concise description of one of the many advantages of random over blocked practice.

Random practice is quite different. Here we mix things up so that we never do the same thing consecutively – except if it happens randomly. Thinking of our golf example, if we take the same 60 balls we hit but now hit them randomly – driver, iron, wood, iron, driver, wood, etc. – this is random practice.



Research demonstrates conclusively that when viewed in the context of learned or retained performance, random practice is vastly superior to blocked practice. This appears true regardless of whether the actual performance is done in blocked (fixed distance, fixed condition sports like archery, range shooting, etc.) or random (dynamic, interactive sports like soccer, volleyball, boxing, etc.) situations.

You might anticipate, and rightly so, that there are some pragmatic issues associated with designing effective random practices. By comparison, blocked practices are easy. Random practices require consideration of transition times and any equipment or personnel changes that need to occur. But, if your goal is to maximize competition performance, aspects of practice should be randomized within and between sessions.

CONSTANT VERSUS VARIABLE PRACTICE

The last thing we'll discuss regarding practice is constant versus variable practice. Here, we're really talking about the conditions in which we have our athletes practice. Constant practice conditions don't change. If you always practice in a climate controlled indoor gym, you're likely practicing in constant conditions. If you always use the same balls, on the same field, at the same time of day, you are practicing in more constant-like conditions. Variable conditions, are, well, more variable. They change. If you always practice on an outdoor field, but do so at different times and all year long, you are certainly experiencing some variable conditions.

When we think of these conditions, we can certainly consider environment factors. Things like light, temperature, wind, humidity, altitude. But, we should also consider situational factors and those that we can manipulate somewhat artificially to create small but important changes in the practice conditions. Things like the field and field surface you play on, noise, fatigue, anxiety, pressure, ball type, ball inflation, etc. are things that might occur naturally in a competitive situation that we should consider incorporating into practice.

Some take home points on practice:

- Considering the success of your athlete's performance during practice can be misleading. Design practices to maximize learning and competition performance.
- Consider advantages of random versus blocked practice. Random practices seem to function similarly to summary or delayed feedback: it provides time and opportunity for the athlete to interpret their performance and adjust the most salient features of it.
- Consider the advantages of variable versus constant practice conditions. The goal in this is to create conditions which encourage and facilitate the development and execution of skill within a more comprehensive set of experiences. From stress to surfaces, introducing different conditions during practice will better prepare your athletes for these conditions when they arise during competition.

So, here it is. The leap of faith. I completely recognize that some of this stuff is scary to think about. Adopting this information means that you understand that by incorporating some of these ideas, you could actually see decrements in your athlete's performance during practice. However, the literature is compelling and there are advantages to these ideas for long-term performance. I'd only end with this. Like anything new, take time to learn more and introduce these ideas at an appropriate time. Certainly, introducing a new routine a month before a major competition is probably not a good idea. But,

planned appropriately, I'm confident some of these ideas can have a lasting and positive effect on your sport.

REFERENCES

If you're interested in reading more on motor learning, feedback, and the design of effective practices, there are a number of excellent and readily available sources. I've provided some key references that I'd be happy to recommend to you. The papers by Chen, Hastie & Hannan, and the last paper by Schmidt and Bjork are probably the most easily digestible. The papers by Magill, Newell, and Salmoni are excellent review papers but are written in more formal and technical tones. Again, if pressed for a favorite, I'd steer you toward Schmidt & Bjork.

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Please do not hesitate to contact me with your questions, ideas, comments, and stories. I welcome them all.

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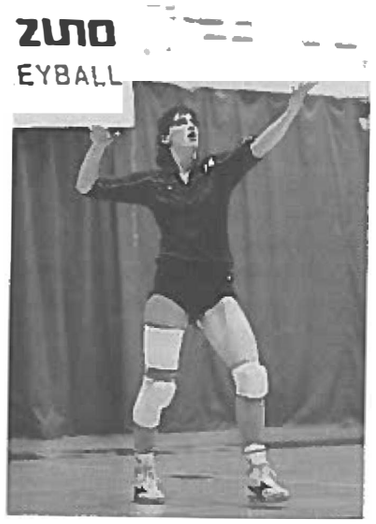
"To get the things we've never had, we must do the things we've never done."

Science of Coaching Volleyball

Carl McGown
Editor

CHAPTER 1



Motor Learning: How to Teach Skills

Carl McGown
Brigham Young University

Shortly before the gold-medal volleyball match of the 1988 Summer Olympics, I was assisting with a USA men's team practice when a Canadian sports broadcaster stopped by, interested in discussing the various practice methods he had been observing. He said the practice methods for the USA men's team were unlike those of any of their competitors. I replied that it was probably because we had Karch Kiraly, Steve Timmons, Craig Buck, and all our other great players. But I knew that our team was also different because the coaches knew and used the principles of motor learning. Ever since

Doug Beal and Bill Neville led the team to preeminence in the early 1980s, the USA men's coaches have used these principles to help develop practice plans. Perhaps your team can benefit from them as well.

When you prepare lessons or practices, you should have some rationale for choosing the methods you select. Can you answer questions like, Why did you teach the skill the way you did? Why did you use that sequence? Why did you use those drills, instructional aids, and cues? Most coaches give answers like, That was the way I was taught, or I saw that drill at the last coaching clinic I attended, or Japan does it. Some even admit, I don't know, it just seemed like a good idea. Such answers are not very compelling to me, because I think teaching is much more than copying others. Teaching is in part a science.

John Wooden, the legendary former UCLA basketball coach, said this about the role of teaching in coaching ("Coaching wisdom," 1988):

> When I was coaching I always considered myself a teacher. Teachers tend to follow the laws of learning better than coaches who don't have any teaching background. A coach is nothing more than a teacher. I used to encourage anyone who wanted to coach to get a degree in teaching so they could apply those principles to athletics. (p. 4)

There are laws or principles of learning that you can use to answer questions like the ones raised. The principles are those of the scientific field called motor learning, an area of psychology that studies factors that influence the learning of motor skills. Research has shown that coaching effectiveness improves when coaches use motor learning principles.

WHY MOTOR LEARNING IS IMPORTANT

Almost everything that a coach does in a practice should be influenced by the principles of motor learning. Suppose you want to teach spiking to your athletes. One of your first decisions must be how you will introduce

the new concepts. Should you demonstrate the skill or not? If so, what should be the nature of the demonstration? How short or long should it be? Should you talk along with the demonstration? What should you say, and how much? Motor learning scholars have studied all of these factors and provide excellent guidelines.

Perhaps later in the season the problem is serve reception, and you are looking for a new drill or two to help your team improve. Would some "pepper"—having two players hit the ball back and forth to each other, taking turns setting, spiking, and digging—help? How about spending time passing some balls that are thrown directly to your passers? Should you lump all of your passing time into one block, or would it be better to spend several smaller sessions working on the skill? Once again, motor learning research has found answers to these questions.

Finally, consider a middle blocker who is having trouble blocking the high-outside set. Some feedback from you would probably help. But what kind of feedback, and how often should you give it? Information feedback has been one of the most widely studied areas of motor learning, and there are some very specific guidelines to follow if you want to enhance your ability to provide information to your players.

MOTOR LEARNING CONCERNS IN VOLLEYBALL

The important events in learning a motor skill are contained in a model developed by Gentile (1972), modified by Nixon and Locke (1973), and further modified here to integrate motor learning and volleyball (see Figure 1.1).

According to this model, the student or athlete

1. determines the general goal of the task to be learned,
2. formulates a plan (or motor program) to use on the first attempt,
3. makes the response,
4. attends to feedback,
5. decides how to try to do it next time, and
6. repeats the process.

A parallel part of the model contains a sequence of teacher decisions and potential coaching interventions. Research, which provides the basis for the principles of learning, is also reflected in the model. Figure 1.1 links the athlete, the coach, and research findings; it can also serve as a sort of table of contents for this section of the chapter. Because most of the important coaching tasks are contained in the first four stages, I will

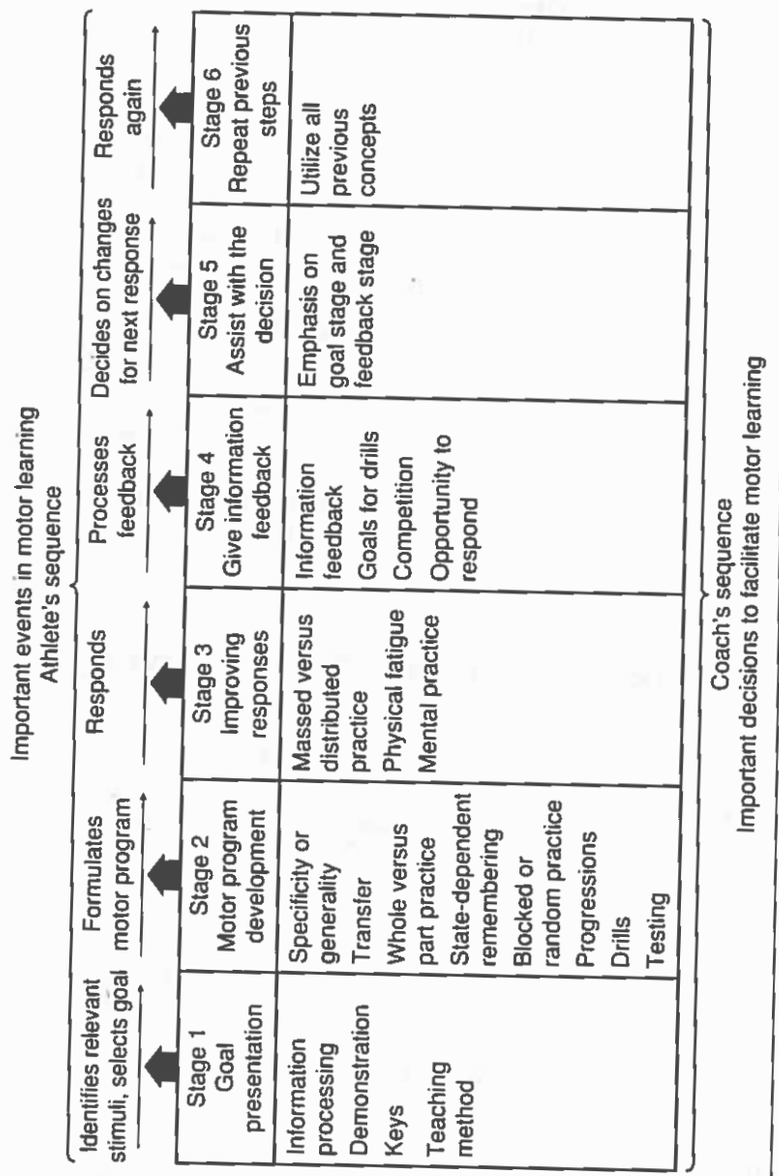


Figure 1.1 Critical events in an athlete's learning and parallel coaching responsibilities.
Note. From "Research on Teaching Physical Education" by J. Nixon and L. Locke. In *Second Handbook of Research on Teaching* (p. 1213) by R. Travers (Ed.), 1973, Chicago: Rand McNally. Copyright 1973 by American Educational Research Association.

focus on those in this section. Thus, the motor learning concerns for a volleyball coach are these:

- Goal presentation (helping players understand how the skills of the game are performed)
- Motor program development (planning practices so the skills of the game are practiced effectively)
- Improving responses
- Giving information feedback to players about their performance

How Can I Help My Players Understand How to Perform the Skills of the Game?

Coaches can help players understand how to perform the skills of the game by limiting the information they give, demonstrating, using keys, and employing a teaching method that facilitates learning.

Limiting the Information Given to Volleyball Players

A primary concept of motor learning is that learners have a finite ability to process information. Coaches can facilitate learning by minimizing the amount of information they present when they are introducing a goal. If you present lots of details all at once, your athletes will simply not remember most of them.

Many volleyball coaches talk too much. They know much about the sport, and they want to share all their knowledge with their athletes. (Other coaches may not know so much, but they still like to talk.) Remember, when you are talking to athletes, they may be getting more information than they can handle, and they are also not practicing. To make certain you don't talk too much or give athletes too much information to process when you are presenting goals, employ these two strategies: demonstrations and keys.

Demonstrations

Motor learning studies have found that the memory retains movement information in the form of an image. Therefore, it makes sense to introduce such information in the form of an image by demonstrating the movement. Other work has shown that people learn most tasks faster when they are shown repeated demonstrations. Gallwey (1974), in his fascinating book *The Inner Game of Tennis*, wrote; "I was beginning to learn what all good [teachers] must learn: that images are better than words, showing better than telling, and too much instruction worse than none" (p. 19).

Keys

Demonstrations alone are not enough. Reseachers have discovered that learners attend to task-irrelevant information when their attention is not directed. Coaches can help overcome this problem and improve learning by using performance cues called keys. Keys are short, concise instructions that serve at least four important functions. They

- condense or chunk information,
- reduce words, thus reducing information processing requirements,
- encourage athletes to attend to important elements of the skill, and
- enhance memory.

An important part of coaching is deciding which keys to use to teach skills and the order in which to present them. (Some evidence suggests that successful teachers do this better than less successful teachers.) Combining the demonstrations and the keys into an effective teaching method is also important.

A Teaching Method

Coaches who realize that athletes have a finite ability to process information want to present the right amount of information at the right speed. Because words mean little to beginners, coaches should avoid constant talk and should keep learners active. (Several studies have found that in a typical class students spend only one third of the time or less on task.) Remember, athletes learn best by seeing and doing. You can get your athletes seeing and doing by including the following steps in your goal presentation method (if the coach already knows the abilities of the athletes, the first two steps can be omitted):

1. Demonstrate the skill.
2. Let the athletes attempt the skill so you can assess their abilities and determine what keys need to be given.
3. Demonstrate the skill, focusing attention on a key.
4. Let the athletes practice, and give them feedback about the key.
5. Demonstrate the skill, focusing attention on the next key.
6. Let the athletes practice again, and give them feedback on the new key.
7. Repeat the process until all keys have been covered.

It is difficult for coaches to know how to choose keys, present them in the proper order, and give the right amount of information at the right speed. At conventions when I talk with coaches about these matters, there is always heated discussion. We usually agree on the concepts, but we

seldom agree on the keys or the order in which to present them. I do know that the selection and ordering of keys are important to coaching success. When I teach forearm passing to beginners, I have four keys that I want them to learn, and they come in this order:

- Place wrists and hands together.
- Hit the ball on the forearms.
- Keep the elbows straight.
- Face the ball, angle the arms.

Most skills can be taught with four keys or less. Continue to work on each successive key until the athletes have achieved some success with it.

A beautiful example of the method can be found in an article about teaching a child to fish by Engerbretson (1979) (I have paraphrased a little to make his ideas apply to volleyball):

> 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. (p. 25)

How Can I Plan Effective Practices?

In the model presented in Figure 1.1, 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 movements. So the movements of volleyball players (serving, passing,

spiking, etc.) are controlled by their motor programs. Making certain that athletes develop effective motor programs is a primary task facing coaches.

One way that the USA men's team is unique is the manner in which they develop motor programs. Because their method is different, I will explain, in some depth, the concepts that support what they do. These concepts are based on the issues of specificity versus generality, transfer, whole versus part practice, state-dependent remembering, and random versus blocked practice.

Does General Athletic Ability Really Exist?

Most people believe in general athletic ability. They believe that someone who can play baseball well should be able to play golf well, that someone who can play basketball well should also be able to play volleyball well, and so on. Back in the 1920s and 1930s, several prominent physical educators even developed a number of general athletic ability tests. But 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 more than 30 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" (p. 126).

How Much Will Practice Transfer to a Game Situation?

If motor programs are specific, several predictions follow, such as the prediction that there will not be much motor transfer from task to task. For example, playing pepper might not help a player much with backcourt defense. The issue of transfer is crucial to coaches, who expect every drill players perform and every practice a coach designs to transfer successfully to game situations. But if playing pepper does not improve the skill of digging hard-driven spikes much, it may be because there is not enough transfer between the drill and the competitive activity. The research here is very clear: There is not as much motor transfer as we might think. Schmidt (1975) summarizes the research: "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" (p. 63). The prediction of little transfer is upheld. What prediction could be made about whole versus part practice?

Should My Players Practice All of a Skill or Only Part of a Skill?

This question is complex because there are problems in defining what is a whole and what is 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. If motor programs are specific, and if there is not much transfer between tasks, then when we are helping players develop a motor program, whole practice should be better than part practice. Nixon and Locke (1973) reviewed the research in this area and found 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" (p. 1216). Some coaches teach spiking by breaking it into parts. First they work on the spiking action or arm swing against a wall, then they work on the approach without a ball, and finally they combine the two. According to Nixon and Locke, it would be better to start with the whole spike and, as I have recommended, use keys to teach the arm swing and the approach.

How Do Athletes Remember?

Cognitive psychologists have found that remembering is state-dependent, which means that when a person learns something, information about the mood of the learner and the environment is stored in memory with the information learned. Performance is significantly better when the environment in which performance occurs matches the emotional state and the environment in which learning occurs. It's no wonder that an inexperienced athlete has difficulty performing before a large audience, or that there is a home court advantage.

Should Practice Be Blocked or Random?

In other words, should there be variability in practice? Armed with the knowledge of specificity, little transfer, the superiority of whole practice, and the state-dependency of learning and remembering, let's make one last prediction: Drills that introduce the variability normally found in a game (random practice) will transfer better to game conditions than drills in which the trials are blocked. For instance, in a blocked practice of the forearm pass, the ball comes from the same place to the same place, allowing many successful repetitions. But the skill is rarely performed under such stationary conditions in a game, so blocked practice does not

transfer well to game conditions. The coach should create practice situations with unpredictable events before players encounter the unpredictability of the full game.

How Does This Information Apply to My Coaching Tasks?

Taken together, the preceding information makes a remarkably cohesive body of knowledge. There are five converging lines of evidence, and this convergence makes the recommended applications even more compelling. These concepts apply to three main coaching areas: progressions, drills, and skill testing.

Progressions

At a volleyball clinic I attended, the coach who taught setting recommended a fairly lengthy progression to teach the skill. The progression started with the player kneeling with both hands on the floor in the correct overhead passing position (thumbs 3 centimeters apart and forefingers 8 centimeters apart). Then a ball was placed on the floor, and the player's hands were placed on the ball in the correct overhead passing position. The next position required the player to bend at the waist and bounce the ball repeatedly from the floor to the hands. Other parts of the procedure had partners facing each other while sitting, kneeling, and lying on the floor on their stomachs. It wasn't until progression 15 that the players actually stood facing each other and passed a ball back and forth, and finally on progression 22 three players passed a ball around in a triangle.

Such extensive progressions are an inefficient and ineffective way to teach the motor skills of volleyball. They don't follow the principles of specificity, transfer, and whole practice. Extensive progressions can be used if there is fear or danger, but there isn't much fear or danger associated with setting.

Clearly, progressions must be used to teach motor skills. If I'm teaching my young son how to spike a volleyball, I don't start by having two imposing blockers block every ball he hits, but I don't start with the ball on a spiking tee either. So what rules can be outlined for progressions? There are two:

- Progressions should be limited in number.
- The ones used should be as much like the game of volleyball as possible.

Setting the ball while lying on your stomach does not resemble the game of volleyball. Nixon and Locke (1973) wrote the following about the effectiveness of extensive progressions: "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" (p. 1217). If you're teaching players to set the ball, the first thing you should have them do is set the ball; if you're teaching them to attack, the first thing you should have them do is attack the ball.

Remember the recommended teaching method? Have them set with emphasis on a key, or have them attack with emphasis on a key, and work through the three or four keys you're using to teach the skill. Don't waste time having them perform activities that do not develop the specific motor programs required for volleyball. There isn't much transfer from lying on the stomach to setting an actual ball. If each day your practices have a greater percentage of transfer to actual game play than those of your opponents, it won't be long until your team is much better than they are.

Drills

Drills, like progressions, must be gamelike. Drills should be designed to develop specific motor programs. Many coaches think that pepper is a great drill to use to teach individual defense. But, in reality, many drills are better than pepper for teaching defense. Marv Dunphy (the 1988 USA Olympic men's team coach) used to say that the best passing drills are pass-set-hit (P-S-H), the best setting drills are P-S-H, the best hitting drills are P-S-H, and the best digging drills are P-S-H and dig. Pepper is not much like volleyball. Marteniuk (1976) says the following about drills:

> Anything less than a game situation, unless very well planned, has the possibility of introducing artificial situations, and complete transfer to the game situation might not occur. When drills are developed, the teacher should carefully consider the way the skills are performed in a game to determine that the drills are as close to the game as possible. (p. 219)

To ensure gamelike drills and increase transfer, coaches should consider these factors when they develop drills:

- The players' positions on the court
- Their movements on the court
- Their orientation to the net
- The sequence of events and the timing of the sequence

- The stimulus to which players react (a coach standing on a table is not the stimulus that a player must react to in a game)
- The natural termination of the ball in play (let most rallies come to a natural termination; don't catch the ball)

Skill Testing

Lawther (1977) wrote, "We have not yet been able to find any means of evaluation of dual or team-sport ability which even approaches the validity of expert judgment" (p. 223). This statement means that we can't really know how well players will play until we put them in a game. For that reason, traditional skills tests should not be the most important element used in team selection. Instead find out who can play the best by watching the players play.

In Super Bowl XXI between the New York Giants and the Denver Broncos, 10 free agents (at that time, all free agents were players who were not considered good enough, coming out of college, to be drafted) started for the Giants (out of 25 starters), and 6 free agents started for the Broncos. Only 6 first-round draft choices started for both teams (out of 50 starters). If the NFL, with all its sophisticated tests and other resources, does no better than this in selecting its players, what can be concluded? The best conclusion is that motor programs are specific and a 40-yard dash test won't tell much about how good a football player is. Neither will a vertical jump test tell much about how good a volleyball player is. You have to use your expertise to subjectively evaluate play.

How Do I Improve My Athletes' Responses?

Coaches should organize practices so that athletes experience many successful responses. (Passing, serving, or spiking a ball are some examples of responses.) Success can be increased by properly scheduling work and rest during practice, not pushing beyond appropriate levels of physical fatigue, and using mental practice.

How Many Minutes Should a Drill Last?

The main question here is, how should work and rest in practice be distributed? If a coach wants to practice serve reception for 30 minutes, how should the time be scheduled? Would it be better to do all 30 minutes at once (massed practice) or to break the time up into smaller blocks, maybe 10 minutes each (distributed practice)? Researchers have studied similar questions for almost 90 years. There have been inconsistencies in the basic

findings, but recent evidence suggests that massed practice reduces both the performance and the learning of a motor skill (Lee & Genovese, 1988).

So the best procedure is to provide distributed types of practice. For example, smaller bouts of serve reception would be better than one long 30-minute session. And instead of simply inserting rests between serve reception practices, have the players practice other activities (like serving or spiking). This system realizes the advantages of both distributed practice (no depressed performance or learning) and massed practice (many opportunities to respond).

How Tired Should Players Be?

Many coaches start practice with long warm-ups, ladders or "suicides" (various running patterns), and other physically demanding routines that produce physical fatigue. When I first started coaching, I had my athletes go through a 45-minute circuit-training program before every practice. We were fit, but could we play? (Actually, we were never very good until I stopped the routine.) Research indicates that physical fatigue reduces both performance and learning. Some coaches argue that athletes have to play when they are fatigued, so they need to learn skills when they are fatigued. However, research has found that this procedure is not justified. It appears that practice under ideal conditions is best for learning, regardless of the conditions under which the task is to be performed. So the best place for circuits, ladders, and most fitness activities is near the end of practice, probably just before the cool-down. Of course, practices can still be demanding, but heavy fatigue reduces learning.

Can Players Think About the Game and Get Better?

Research has consistently shown that mental practice can aid in the learning of motor skills, and mental practice is probably best when it is combined with a relaxation program. Sport psychology has made excellent use of routines that combine relaxation and visual imagery. Effective mental practice has these six critical features:

- Mental practice is best when combined with physical practice.
- The performance environment (gym, crowd, etc.) should be visualized when the athlete mentally practices.
- The skill should be performed mentally in its entirety.
- The skill should be rehearsed mentally as being performed successfully.
- The mental practice should be at or near the actual rate of performance.
- Athletes should concentrate on imagining how the action feels.

A coach must realize that the ability to profit from mental practice has to be learned, just like any other skill. As such, it must be practiced; skill development takes time. Because mental practice is difficult to learn, coaches who want to teach it to their teams are advised to read some of the numerous available resources or seek help from someone versed in the procedure. (See chapter 2 for more on mental practice.)

What Information Should Players Receive?

Information obtained after a response, called information feedback, is generally viewed as the most important variable for determining learning, except for practice itself. The following principles will assist coaching.

- The information presented must not overload the information-processing ability of the athletes. Coaches who do not use keys (like the ones discussed on pages 6-7) are more likely to overload players than those who do use them.
- Two types of information can be given: knowledge of results (e.g., That was a straight-down spike) and knowledge of performance (e.g., Your four-step approach was perfect that time). Because knowledge of performance is not easy for the learner to obtain alone, it is especially important for the coach to provide knowledge of performance in the early stages, when the learner has not yet developed an internal standard of correct performance.
- It helps if the coach has playing experience. Hoffman (1983) found that the teacher's analytic proficiency is influenced more by experience with a skill than by the highly organized formal training programs often received in a university education. So it is a good idea for volleyball coaches to learn how to play volleyball.

The primary role of information feedback is to allow the learner to evaluate the response. It provides a framework of reference so that the athlete can detect response errors and attempt to correct them.

Information feedback also performs an important motivational function. Positive information is a great motivator. When players are observed during a break in practice, they are almost always spiking or trying to spike the ball, and they are rarely working on blocking. One reason for this is that positive information is readily available in spiking but very difficult to obtain in blocking. So the information gained from spiking performance is sufficient to maintain practice behaviors (they practice spiking even during breaks) for long periods of time. Players enjoy practices in which they get to spike. Remember how Marv Dunphy recommended the pass-set-hit drills? Coaches should use the players' love of spiking to their advantage when they organize practices.

Players also like practices in which they get lots of positive feedback, because positive feedback is very motivating. So coaches should do everything they can to increase positive feedback in practice. The USA men's team does this in two main ways: setting goals for drills and building in competition.

Goals for Drills

Many coaches like to run very precise practices and schedule exact time periods for each phase of practice. For example, a coach might say something like this: "OK, you know how important serve reception is to our succcess, so I want you to spend the next 15 minutes working on it. Get after it! Work hard!" But players don't work very hard under these conditions, and when they finish they really have no idea how they performed. A much more desirable procedure would be to give the players a goal. For example, say to each player: "I want you to pass 50 balls, and when you finish tell me how many out of the 50 were perfect." Players work harder under these conditions, and when they finish, they know exactly how they have performed. An additional possibility is to say that the team on defense will remain on defense until it beats the offense a certain number of times (or maybe a certain number of times in a row). Now if I defeat you in 2 minutes and it takes you 7 minutes to defeat me, I know that my performance was very good. I know, because I received information feedback.

Competition

Another way to increase information feedback is to make drills competitive. Many observers believe that the USA men's team is the most competitive team in the world, and they are the most competitive team in the world day after day after day. Most other international teams choose the times they will compete, but the USA men are always on. They compete so well because virtually everything they do in practice is competitive, and you can't be competitive without goals for your drills. When players compete in practice, they learn to compete, and they also receive more information. They know whether they have won or lost.

Opportunity to Respond

At the beginning of this section the following statement was made: Information feedback is generally viewed as the most important variable for

determining learning, except for practice itself. You need practice trials in order to have information feedback. Several studies have shown that the number of times a player practices a skill (at an appropriate difficulty level) is the best predictor of improvement. So coaches should maximize the number of practice trials, or the number of opportunities to respond. There are four main ways to do this:

- ***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 allows gradual warm-up. After this game-specific warm-up, add stretching activities (to guard against injury). The extra 10 minutes spent on ball handling will give you an advantage over teams that warm up by running around in circles.
- ***Tutoring.*** In a tutoring session, the coach and one, two, or three players work together to practice a specific skill. Because only a few players are there, each player gets numerous opportunities to respond and receives considerable feedback. Virtually every practice should be preceded by a tutoring session, and it doesn't hurt to end every practice with one.
- ***Small groups.*** A certain amount of practice should include six-on-six gamelike drills, but when players play six-on-six, each has fewer chances to play the ball. It makes sense to schedule a number of small-group games, like doubles or triples. If a team of 12 players is divided into three games of doubles, each athlete plays 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 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 first one team was successful and then the other, then no points were scored and it was a "wash." The goal can be any number of in-a-rows, so if the goal is to win five in a row, then after the serve, four balls would successively be thrown into play (as long as the same team kept winning the rallies). In this system, the extra balls thrown into play provide many more opportunities for players to respond.

Using all four of these procedures can have a dramatic cumulative effect that gives a team a real advantage over other teams. Try them!

PUTTING MOTOR LEARNING TO WORK FOR YOU

The examples in the "Motor Learning Concerns in Volleyball" section showed how a coach can use motor learning concepts to benefit the players. In this section I sketch a model practice (in which the players learn a new skill and practice three old skills) that emphasizes many of these concepts. An outline for the practice is included in Figure 1.2.

Starting Practice

Develop a regular routine for starting practice. Having a formal beginning tells players that practice is serious and important. For example, you might use a whistle to start practice and ask the players to stand on a line in front of the blackboard, where any necessary announcements can be placed and where the daily practice should be outlined.

Players should not stretch their muscles until they are warm, so start practice with easy ball-handling drills. Have the players pick a partner and get a ball for some ball-handling drills (opportunities to respond) that are progressively more difficult and eventually cause a light sweat. Because the first part of practice is devoted to teaching, the warm-up should not be too vigorous. Warm-up should be followed by stretching.

Teaching New Skills

When you teach a new skill, arrange the team so that everyone can see and hear. Take a few minutes to explain and demonstrate the skill. Begin

- 2:00: Lineup, announcements.
- 2:05: Warm-up.
- 2:15: Introduce new skill (blocking).
- 2:45: Serve and serve reception practice (doubles ladder).
- 3:20: Transition hitting (six-on-six, four in a row).
- 4:00: Jump training, warm-down.
- 4:15: Lineup, termination of practice.

Figure 1.2 A model practice outline.

by explaining why the skill is important. In this model practice, the team is going to work on a difficult read-and-react blocking skill, so give the players some reasons why they are going to learn it.

The skill should be demonstrated by someone who can illustrate the important aspects. The first demonstration should be fairly brief and include five or six repetitions of the whole skill. Have the athletes watch from two vantage points. In the case of the read-and-react block, they should view the demonstrator from the front and the side, as these two angles give the clearest picture of what is required in the skill.

Present the keys the players will need to practice this skill. (Normally you should preassess the players' ability to perform the skill before selecting and presenting keys, but for this model practice, the players have no previous experience with this skill.) The first key involves watching the flight of the passed ball and then the setter (ball, setter, ball, hitter). During the first demonstration, have them focus on this aspect.

Have the players practice the skill. As they practice, give feedback (mostly knowledge of performance, e.g., That was perfect, you watched the setter set the ball just the way you should) on only the first key. Try to be positive and compliment effort. You may need to show the key again, and periodically you should ask the athletes to repeat what you've said and done.

When the players have achieved some success at the first key, repeat the process. Demonstrate again, but this time ask the athletes to attend to another aspect of the demonstration. Have the players practice again, and give feedback on the second key. You may need to remind a few athletes of the first key, but emphasize the current objective.

As discussed earlier, you should have your athletes practice on the whole skill, with very few progressions. Because blocking is difficult to learn, it isn't necessary to have the players block live spikes immediately, but the initial drills, like the game of volleyball, should have a ball in play. After three or four keys have been presented (you don't want to overload information-processing ability), and after the whole skill has been practiced with limited gamelike progressions, gamelike drills, and feedback on the keys, terminate this phase of practice. The athletes will need to practice the skill again and again on future days, for performances are still far from perfect. Answer any questions that arise, allow athletes a water break, and move on to the next phase of practice.

Reviewing Skills

Two of the skills that should be practiced every day are serving and serve reception. In this model practice, a round of doubles ladder is used for serve and serve reception practice. The doubles ladder is like a free throw ladder in basketball or a challenge ladder in tennis. The players are listed in order of ability, and players can challenge those above them and take their places on the ladder if they are victorious. Today the team has been divided into three groups of four, and the players will play doubles on three courts (yes, we are lucky enough to have three courts on which to practice). In each group of four, everyone plays doubles with everyone else. Thus, there are three matchups: 1 and 2 versus 3 and 4; then 1 and 3 versus 2 and 4; and finally 1 and 4 versus 2 and 3. Scores for each player are kept for all three matches. After all the matches for the day are over, the top players (based on the points they have accumulated) in Groups 2 and 3 move up a group, and the bottom players in Groups 1 and 2 go down a group.

The doubles ladder provides lots of opportunities to serve and serve receive. The coach can throw an extra ball into the game when a rally has terminated (as in the in-a-row routine) to provide even more repetitions. The doubles ladder is gamelike and competitive, the coach can give feedback as the players play, and the players receive other informational feedback because they know how well they do in the pairings. Games to 15 points (rally scoring) in each of the three matchups take my team about 30 minutes. You will, of course, want to find out how long your team requires.

After the doubles ladder, the team works on transition hitting in a six-on-six format. The drill for this model practice is a simple in-a-row game. The team on offense must win the serve reception and three more rallies in a row. Each rotation is allotted 5 minutes to accomplish the goal, and if the team doesn't finish in the allotted time, the teams rotate and the defense scores a point. If they do finish, the offense scores a point and the teams rotate. The time required to finish is recorded. Now the team that was on defense goes on offense and tries to beat that time.

The drill has many of the same advantages as the doubles ladder. There are lots of opportunities to respond, it is a game, it is competitive, and there is feedback because the players know how well they do in the matchups. An assistant can keep statistics on hitting or other aspects during the drill, and if a certain rotation always fails to finish on time, the coach will have an indication of which rotations are weak and need special attention.

Conditioning

The previous drills will have taken approximately 2 hours. It is time to do jump training, interval running, or other fitness activities. Next will come warm-down and the final lineup before practice ends.

Applying Motor Learning Principles

That's all there is to it! A quote from *In Search of Excellence* by Peters and Waterman (1982) expresses how I feel after presenting these ideas. Peters and Waterman teach classes about successful businesses and the traits these businesses employ. Sometimes they have problems communicating this information to their students. They write:

> The traits are obvious. Presenting the material to students who have no business experience can lead to yawns. "The customer comes first, second, third we say." "Doesn't everyone know that?" is the implied (or actual) response. On the other hand seasoned audiences usually react with enthusiasm. They know that this material is important.... They are heartened that the "magic" of a P&G [Procter & Gamble] and IBM is simply getting the basics right, not possessing twenty more IQ points per man or woman. (p. 17)

The few basic motor learning principles that we have outlined are important. Did they lead to yawns or enthusiasm? The magic is in getting them right, in applying them properly. The USA men's team follows these principles and wins gold medals. Try them and see how you do!

KEYS TO SUCCESS

- **Goal presentation**
  - **Athletes have a limited ability to process information, so help them remember information and learn faster by using demonstrations, keys, and feedback about the keys.**
  - **Present small amounts of information at a steady rate—not too much and not too fast.**
- **Motor program development**
  - **Make sure that your athletes develop the specific motor programs required for playing volleyball. There isn't much transfer from one motor task to another.**
  - **Practice skills as a whole rather than in parts.**
  - **Limit the number of progressions and keep them gamelike; make drills competitive and gamelike.**

- **Improving responses**
  - **Have players encounter skills under ideal conditions: Schedule practices that have a pleasing distribution of practice time and that do not promote heavy fatigue.**
  - **Teach players the proper methods of mental practice.**
- **Giving information feedback**
  - **Make certain that there are numerous opportunities to respond and lots of feedback about those opportunities. Do everything you can to increase practice attempts and meaningful information feedback.**

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Smash Volleyball

Motor Learning

Motor Learning Principles:

Coaching is like teaching – good coaches have to follow **the laws of learning:**

1. **Reduce the information we give to volleyball players**. Learners have a limited ability to process information. When we introduce a goal, we need to do so in as few words as possible.
    a. Use Keys to give information verbally

        Keys are short phrases that condense or chunk information. Advantages:

a. Players pay attention to the important elements of the skill
b. Coaches pay attention to the important elements of the skill
c. Enhance memory
d. Show don't tell – demonstrations and video of the right way (along with video of how the athlete is doing it).

> "All good teachers must learn that images are better than words, showing is better than telling, and too much instruction is worse than none." Gallwey – The Inner Game of Tennis

1. Transfer: Research shows there is not much transfer of success from one activity to the next unless the tasks are almost identical. **The more practice activities resemble what players do in matches, the more success in practice will translate to success in matches**.
2. Whole vs Part – because motor programs are so specific, the research is clear that the best way to learn a physical skill is to practice the whole skill, rather than breaking it up into parts.

When we teach a skill to our players, we will have them practice the whole skill and use Keys to focus their attention on a part of the skill.

1. Random vs blocked practice
    a. Blocked - example: coach tossing to setter, setter sets hitters. Not much variability, lots of success in practice. Players and coaches feel like there is tons of improvement.
    b. Random – example: ball is hit over the net to players who pass to the setter who then sets the hitters. Lots of variability, not as much success in practice. Players and coaches may become frustrated with difficulty and randomness.
    c. The research is clear –**random drills transfer their success to matches much more than blocked**. Use random drills except when players are brand new to the skill. The Paradox – blocked practice appears to learners (and coaches) to be more successful during practice because athletes have more success. In games, random practice shows better results.
2. Physical fatigue reduces learning. The best place for conditioning is at the end of practice, after learning has ended.

John Kessel: My Players Don't Move Their Feet

BY **JOHN KESSEL** | **APRIL 03, 2018,** 4:17 P.M. (ET)

Perhaps the most discussed topic on the Facebook group “Volleyball Coaches and Trainers” is the exasperation of coaches who see their players, mostly younger ones, not “move their feet” on serve reception, defense or team systems in general.

Why this happens is simple - what you see in the game is a product of your practices. Remember, the coach who knows why beats the coach who knows how.

The players are not sure where to move to meet the oncoming ball, in large part because too many coaches drill in ways to make practice “look good.” Instead, in practice coaches should play the imperfect realities that happen in competition at every level of the game. If our U.S. Women’s National Team is out of system 48 percent of the time in games, with as much experience and training as they have, what do you think the reality will be percentage wise for your 13U team?

Your Volleyball Coaching Style

Let me give you some examples. See if you can find your teaching/coaching style below. This is based on the book about John Wooden titled “You Haven’t Taught Them if They Haven’t Learned.” Do you do any of the following?

- You let your players stand off the court in your hitting drill. Then, you feel the need to do “pass to hit transition drills” as your players are not good at moving off the court to hit.

- You let your players fly under the net after they spike in your hitting drill. Then, you require your athletes to do “transition off the net” drills since they stand at the net after being blocked and don’t quickly move off to hit again.

- You yell, “O.K., serve!” You watch your players serve and admire their serves rather than running to defense. Then, you bemoan and admonish a player in a match when the opponent’s serve drops into where your player should have been. So, you punish the player or whole team with the running of sprints or lines.

- You teach players blocking by having them stand on a box, even hitting at them yourself. Then, you get frustrated when your blockers don’t know how to be at the right place and time to block a live, moving hitter.

- You teach the setter to read your nearly perfect throws to the setter spot without ever moving the ball cart. Then, you are baffled when your setter can’t read a serve receiver or set the 90 percent of the balls arriving outside the pass target.

- You teach “shadow blocking” for a warmup/footwork drill, letting the whole team move down and along the net in pairs blocking each other. Then, you get upset when your players are blocking in the wrong place (directly in front of the other player), at the wrong time (jumping at the same time as the opponent on the other side of the net), or they net fault (rather than be pushed back/kept off the net by the other shadow blocking teammate).

- You let your players pair pass and/or pepper for 10-20 percent of practice on the same side of the net. Then, you punish them for not moving their feet on the 100 percent of the serves and spikes that come from over the net.

Amazingly, a common place the coach “teaches” is in between the sets of a match or at a match’s end, by making the team run lines, do pushups, or some other form of punishment. This wastes valuable learning time in the belief that it will thus “teach movement.” That the players are not moving means they are not reading in time.

The frustrating part to me as a teacher of coaches is that those players who perform below their norm or fail to move well, who then are punished also then regress to their mean and play better, and then the coach believes that it is the punishment that worked. Sadly, they are being fooled by regression to the mean, and thus are not teaching as effectively as they could be by trusting their players and guiding their discovery and game play reading.

That your players will enter the season guaranteed to play 50 percent of the time below their average means that some days they will be moving great and other days not so well. It is not caused by staying up late or not caring about moving. The examples above show how the most likely cause is the false confidence being instilled by nonreality-based drilling. It also simply happens because some days you are the windshield and some days you are the bug. On any given Sunday any NFL team can win, even over the best team in the league.

Improving Your Players' Footwork

Please improve your players with these suggestions:

- Train in reality
- Use the net all the time of your 90-120 minutes of training
- Trust your players that they do not err on purpose

- Know your job in practice is to increase their volleyball IQ, especially their reading of the game on the opponent's side of the net, so do your job and guide their discovery.

These ideas add up to more effective and efficient use of your training time. Otherwise, players only learn the game from the tournaments. No matter what less-effective training has happened in the gym, the reality of the game, referees and fans included, lets the athletes learn in a truly game-like way. With 12 on the court and up to 12 on the bench watching, and only one ball flying around, it is not maximizing the reps young players especially need. They learn technique/motor skills by doing, not watching. If you don't believe me, you have yet to teach your teen kids to drive. They have watched you drive for all their lives up to that point. But the insurance companies know they don't know how to drive, as shown in your monthly rates.

Promoting False Confidence (/USA-Volleyball/Features/2016/November/07/Promoting-False-Confidence) | **What Is It With Physical Punishment?** (https://www.teamusa.org/USA-Volleyball/Features/2016/May/27/What-is-it-with-Physical-Punishment-in-So-Few-Sports)

For more insight into how to help your players move their feet, click on the two blogs below. For more insight on Regression to the Mean, email me at john.kessel@usav.org (mailto:johnkessel@usav.org), and I will send you the article Decisions, Decisions on Nobel Prize winner Dr. Kahnemann's "most exciting moment of his life." when he realized the fighter pilot instructors he was teaching, were being fooled by not understanding why they thought punishment was working.

Comments

About

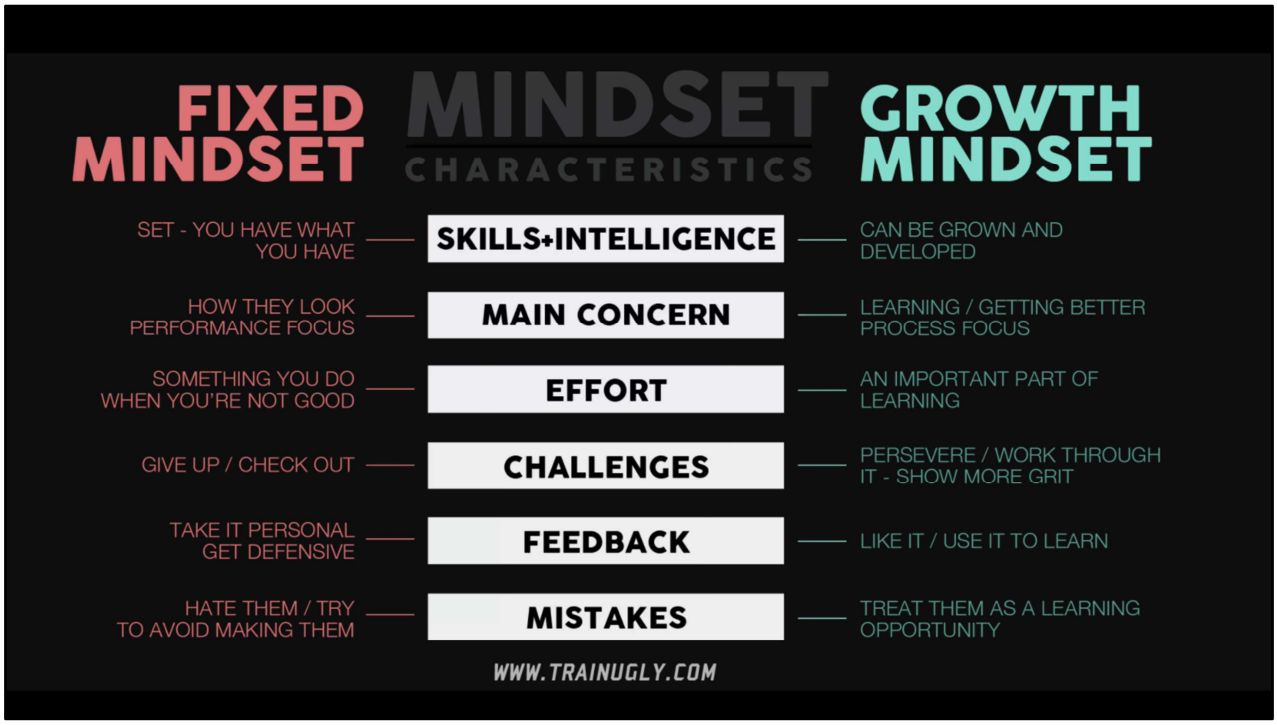
Resources

Applying a Growth Mindset in Volleyball

Sara Lippitt
Dig It With Sara

What is a growth or fixed mindset?

- Growth Mindset
  - Ability that you can get better at any skill.
  - You have the capacity to learn.
  - Skills are built.
- Fixed Mindset
  - Skills are set. Can't get any better.
  - No capacity to learn.
  - Skills are born.


FIXED MINDSET
MINDSET
CHARACTERISTICS
GROWTH MINDSET
SET - YOU HAVE WHAT YOU HAVE
SKILLS+INTELLIGENCE
CAN BE GROWN AND DEVELOPED
HOW THEY LOOK PERFORMANCE FOCUS
MAIN CONCERN
LEARNING / GETTING BETTER PROCESS FOCUS
SOMETHING YOU DO WHEN YOU'RE NOT GOOD
EFFORT
AN IMPORTANT PART OF LEARNING
GIVE UP / CHECK OUT
CHALLENGES
PERSEVERE / WORK THROUGH IT - SHOW MORE GRIT
TAKE IT PERSONAL GET DEFENSIVE
FEEDBACK
LIKE IT / USE IT TO LEARN
HATE THEM / TRY TO AVOID MAKING THEM
MISTAKES
TREAT THEM AS A LEARNING OPPORTUNITY
WWW.TRAINUGLY.COM

What does this a fixed mindset look like in most players?

- Desire for perfection.
- Frustrated with every mistake.
- Constant need to do what is comfortable.
  - Partner passing, peppering, not wanting to do a jump serve when you've been doing well on it lately.
- "But I missed my serve" "I hit it out of bounds" etc.
- Deflects blame of error on others.
- Worried too much about how the skill looks to everyone else.

Check out Train Ugly's website: trainugly.com
Jungle Tiger v Zoo Tiger

Talk about zoo tiger/jungle tiger
Struggle and suffering v easy

Growth Mindset

- **Encourage mistakes.**
  - Mistakes = learning. Mistakes = mastery of the skill.
- **Celebrate the small details, regardless of the outcome.**
- **What did you do wrong and how are you going to fix it?**

Push players outside of their comfort zone – that's where the real learning begins.

I asked you to make sure your last two steps of your approach were fast and dynamic, and you did that! (Even if you hit it out of bounds). See the forest through the trees.

> Get rid of the "what should I have done on that ball" questions on the court. Use a Socratic method of teaching so that the player is empowered to know what they need to do to get better on the court on their own. Coaches can't be on the court physically moving your body, so you'll need to know some of this on your own.
> No more glances at the bench with the look of "HELP COACH! I DON'T KNOW WHAT TO DO! Yes, you do. Or if not, try to figure it out on your own. Coaches should guide them in the process of learning.

What does this have to do with coaching?

- **In order to have successful players, we need to have a growth mindset.**
  - Mistakes are not punished, they are encouraged.
  - Process > Performance/Outcome
  - Focus on the one thing you're trying to get better at (while teaching the whole skill. Whole > Part).

Teachable moments. Players are risk takers knowing their coach isn't going to *scream at them if they hit it in the bottom of the net or miss their serve.*

Fear of making mistakes leads to a player that lacks confidence in their abilities and instead might retreat to easier serves to just get it in and not have to run, instead of working on serving more aggressively

ve them replay the error or use video delay feedback to see the error themselves.

Most kids don't want to look bad or make mistakes. Push players outside of their comfort zone with drills they may not look good in or do well at initially.

Celebrate when the player does the correct part of the whole, regardless of the outcome.

Let’s see this put in practice!

Growth Mindset
Process > Outcome

Here is a picture of my 13U girls at their 2nd tournament of the year. We created a goals board with the following goals:

- Jump & Swing (didn't even have to touch the ball or get it in)
- Jump Float Serve attempts (some girls were scared to jump float serve in a game).
- Aces (more outcome based, but I encouraged them to serve aggressively, regardless of the consequences.
- Individual goals.

Bonus Points!

- Dives (not being afraid of the floor)
- Kills

Growth Mindset
Process > Outcome

The girls went 1-2 that day, but they were more excited and proud about accomplishing their goals board that the losses didn't really matter. Now they always want the goals board at tournaments.

Look at how happy these girls look!!! ☺

Socratic method of coaching

Positive Learning Environment to Foster Growth

Positive Learning Environment to Foster Growth

Errors are how you learn!

What are the characteristics of a growth mindset drill?

- Drills should: try to eliminate punishments based on errors, rather rewards for doing the skill or part of the skill (process > outcome).
- As per my previous presentation, involve a game-like scenario (that way we aren't afraid to make mistakes in practice AND games).
- Encourage players to go outside their comfort zone.
- Don't penalize for the specific skill you're working on. Instead, give bonus points.
  - Work on taking an approach (younger kids) – no penalty if the player misses the ball or hits out of bounds, just a wash.
  - Work on serve hard, aggressive, and challenging the passers (older kids) – no penalty for serving out of bounds (but in the net is a penalty).

Positive reinforcement skills

- 2v2 rewarding for attempts.
- Servers v Passers – no points for missed serves. Points for 2 contacts on shanked passes.
- Neville's Pepper (6v3), 3s side doesn't lose points on errors because they are the only side that scores.

Ball, Setter, Ball, Hitter

6v3 (3s side: setter, hitter, Lib). Games to 20. (6s side needs to have a block and read). Initiate to the 3s side however you want (serve, FB, downball, etc).

<u>3s side gets a points for:</u>
+1 swinging kill
+2 roll shot kill
+3 tip kill
+4 setter dump

<u>6s side gets points for:</u>
+1 proper read and attempt
+2 proper read and attack but out of bounds
+3 proper read and attack in, but hits the tape.
+4 proper read and attack in but doesn't hit the tape.

Not punishing reading and attempting!

0-10-20 Drill

Servers v Passers. There is only 1 score to keep track of. Both the serving team and the passing team share the score. Start a scoreboard at 10 on one side of the scoreboard. Ignore the other side. Servers are trying to get the score down to 0 from 10. Passers are trying to get the score up to 20 from 10. The score will fluctuate with each pass/serve. You can adjust the scores to emphasize what you are working on. However, I try to make sure I do not penalize points for serving aggressively (out of bounds).

3 option: +2
2 option: +1
1/0 option: wash
Aced with a touch: -1
Aced without a touch: -2
Missed serves in the net: +2
Missed serves out of bounds: wash

Not punishing missed serves!

Smash Volleyball

Mental Training and Growth Mindset

Fail Faster:

By Mike Gervais - Pinnacle Performance, consults with the women's national team.

You have a comfort zone in which you are competent and confident. Within your comfort zone are all the skills and areas at which you are highly proficient: passing on your left side, for example, or hitting cross court, or bump setting, etc.

The fixed-minded athlete (see Mindset–all of us have some fixed mindset traits within us) wants to stay within that circle of competency, or circle of comfort. Staying within the comfort bubble means you will rarely fail and you will appear competent and masterful to those around you. You will look and feel good. And you will delay learning and progress.

The growth-minded person eagerly goes outside her circle of competence. She instinctively practices on the edge of her ability level because she knows that is where growth will occur. She is willing to fail as the fastest course to growth and improvement. FAIL FASTER, LEARN FASTER.

Recently an athlete who always served a jump spin serve, was learning a jump float serve. I was observing her and noticed that she was being very safe–afraid to really go for it–just trying to hit it in. It was already uncomfortable for her so she was tossing and contacting low and hitting it with her whole hand kind of like a jump spin serve.

As a very accomplished volleyball player, she was probably not comfortable with looking incompetent. She was failing occasionally (making errors*) but she was not getting anywhere because her mistakes were within a comfort zone. She wasn't failing on the edge of her ability level. She wasn't failing fast enough.

I talked to her about this and challenged her to toss and contact it higher and hit it harder with the heel of her hand. To make mistakes "going for it" in order to accelerate her progress. I asked her to hit some hard with the heel of her hand to feel what it's like, even if it meant hitting it long. She did and failed occasionally, but she also hit some good solid floaters in the process. She quickly improved.

I've seen this process successfully played out in Tom Black's tutoring sessions with the setters in USA's training gym.

My assistants and I talked about this "failing faster" concept, in particular about the fear of looking incompetent. I believe such fear is a major obstacle to growth and improvement in sport. Everyone (most notably coaches and teammates) is seeing you fail and that's uncomfortable–even scary. It certainly was for me as an athlete. I was, and still am to a large degree, very much about looking competent. I can think of times when I was focused on improving and okay with failing, until I thought someone was watching me, then I would retreat to my circle of competency.

Athletes need to practice outside of their circle of comfort, but compete within it. By practicing on the edge of their ability level they EXPAND THEIR CIRCLE OF COMPETENCY.

It is in practice, particularly in activities where they are simply getting reps, where they need to be on the edge of their ability level–outside their circle of competency. That is where learning occurs.

It is clear that a coach's primary job in practice is to keep players on the edge of their ability level. To "push" them. Some of that will be asking them to mindfully practice things that are uncomfortable (an exercise in mental toughness). Other times, when they are competing in practice, we will be pushing them to be totally focused on playing to win, especially when circumstances are difficult (another exercise in mental toughness).

The players job is to do these things without our having to push them.

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10 new volleyball coaching commandments (/USA-Volleyball/SportKit/Core-articles-for-all-ages/10-new-volleyball-coaching-commandments)

More

From Positive to Perfection

By John Kessel, USA Volleyball Director of Sport Development

There is a new principle which I would ask all coaches and players to incorporate in their training, something that goes against the traditional way of training as well as the easier options currently being done. After almost 40 years of coaching, I have seen the very beneficial and successful impact of focusing on this concept at every age – from youth to Olympic team. The title says it all – to first teach positive errors on the path to perfection, in every training.

This change in culture will likely take time, as the options are more game like and thus more difficult than the non-game like traditions currently being used, but changing can make for significant and rapid improvement, especially at the younger levels. The concept here is to teach our kids to make mistakes that are better than those traditionally being developed. The intent is give developing players a margin of error, rather than a small point of perfection. A grey area over the bright light of the perfect contact, a space/area/side/flight or whatever that is OK, rather than the black holes of similar but far more rally ending contacts. Give them room to err as they learn perfection. Let me share with you the most common examples:

Spiking

The Tradition is let kids do wall spiking. Coaches speak of how it is done to develop wrist snap, and more. So if you become the Olympic gold medalist in wall spiking. What do you see happen when you as a world class wall spikers hit over a net? Yep, you are conditioned to hit into the net, into the block, heck, even under the net, with the habits you have formed.

The New Tradition

Put up a “net” on the wall at both men’s and women’s heights and teach the new tradition of playing games against the wall over that stripe. We used colored duct tape, giving each court and side a new color for the colorfulness of it. Set to yourself then hit against the wall over the tape, and repeat. Play one on one cooperatively to see how many dig to self, set to self, hit over the line three contacts you can make happen with a teammate.

Why positive over negative? You want your players to hit the ball over the net, and make the opponents think and your teammates in practice learn, “In or out?” You want to give yourself a chance to hit off the blockers hands and out of bounds. When you hit over the net, you get tape shots that clear the net, and teach teammates that vital read and react skill. When you hit into the net, none of these important things can happen. Hitting into the net is a very negative error, hitting over the net and out is positive and should be taught from the start.

Passing

The Tradition is to pair up and partner pass. So if you become the Olympic Gold medalists at partner passing. What do you see happen when these world class partner passers actually serve receive? Ask any beginning coach, for they know as they see the first hit going back to where it came from, while they plead “Three hits, three hits, pass it to the

setter." Ask any setter, for they know when they see the ball being served to zones four and five that they must move from their setter target slot, forward, as the passers don't pass over to them, but instead pass straight ahead. This bad habit is further promoted by wall passing, which is simply a disguised form of partner passing. Once again, I want to get even better than my Olympic Gold medal pair passing partner, I will go train by myself to get better (a good thing!) and pass thousands of balls against the wall. I now am the world's best at putting the ball straight back to where it came from.

The New Tradition
From the start, the athletes need to see the ball coming from OVER the net. That said, you can err by passing off target but towards your teammates or you can pass away from the setter and away from your teammates. The good mistake is to err towards your other five friends, and not err by passing to the other court or fans.

The second positive error you want to make in passing is to pass UP first. The target is always the setter spot, but if you err up, the setter can run and still get to the ball, or another teammate can play it, even if your error is well off the setter target spot. Err low, and everyone whirls as the worm burning shot flies by below their knees, and someone says "Nice try…" This goes hand in glove with where the setter target should be, which is suggested to be 2 meters off the net, perhaps three meters for true beginners. This way you can err with your pass by two meters and the ball is still on your side and playable.

Serving
The Tradition, like spiking, tradition sees focus on the negative error when you serve into the net. The other team could be wax statues on the court and they will get the point. We must learn to serve every error over the net, and at least get a chance to knock over a wax statue player, and get a point. Serve into the net, everyone knows it failed to clear; serve long and there are officials and line judges who have called a ball in, even when it was slightly out. In training, when you serve out, your teammates learn – In? Out? – an important decision and read. When you serve out long, your opponents will sometimes still pass the ball, and your error is no longer an error. Playing in the wind, I have never seen a ball blow up and over the net from being served too low. I have however seen the wind blow the ball back into the court, an ace virtually every time.

The New Tradition
In addition to serving over and not into the net, have your players RUN into the court to their designated back row defense court position after every serve. That is what you want them to do in the game, so why not do the same in practice.

Setting
The Tradition, I remember learning to back set, standing in a straight line, and finally successfully sending the ball back over my head to my partner directly behind me. Should you become the Olympic Gold medalist at back setting in a line, when I get into the game, I will face where the ball comes from, out in the court beyond the 3 meter line most often, then fire up the habit my coach taught me, and launch the ball over the net behind me. The tradition is for the setter to stand right at the net, hand up, waving the famous "right here" motion. As noted in passing above, if you stand this close, you then have half of your almost perfect passes, one meter off target is all, to the setter, flying over the net to the opponents. Tradition also has us setting the ball right next to the net, and setting the ball high to first teach hitters how to hit.

The New Traditions
Start setting your very first sets on angles, while standing further away from the net, and setting at the 3 meter line. Young players might consider doing this whole triangle of pass off the setter's toss-set off the net-hit over the net to occur even further off the net, say starting six meters back. As the players improve, or as good players warm up, you move your sets to be closer to the net, but never any closer than a meter off the net. As we must give the hitter room to swing through, to safely land off the center line ankle spraining area (as we learn how to jump, read the set and adjust to the variances), and so that the hitter does not have a wall of hands inches away from their contact point, but instead has lots of space and angles to move past the block to the right, left or even over the block. For younger

players, the NET is a huge block to clear, when they are set too near. Teaching in this new way, the back set first should be set to the 3 meter line and as their skills develop, they can put the ball two meters off the net, then finally one meter off the net, but never over the net as their shoulders might want the ball to go. The three positive vs. negative concepts for setting are: Better too high than too low (time to adjust) Better too far off the net, than too tight to the net (room to swing and safer) Better too far inside the court, rather than outside the antenna (you still have the whole court to hit and land safer).

Digging

The Tradition is to partner pepper, as coaches go on and on how it "teaches ball control and warms up their arms…" So….back to the Olympic Gold Medal standard – two of your players practice it so much and for so long they become the world's best at partner pepper, and what do you have? You have two players who are the world's best at digging a spiked ball straight back to where it came from… the best at hitting down (as in into the net), and directly at a player (rather than at spaces and away from a vertical target), two players who, the better they get at pepper, the less they have to move (where great diggers can move more and more on the court), and much more. For the purposes of this article, the first two negative errors are the biggest concern. For when a player is taught to dig a ball coming in at no more than 2/3rd full speed, and to dig it back to the attacker, you can imagine where the ball is likely to go when an opponent is hitting a full game speed. As a lefty, I wish I had a dollar for every ball I spiked cross court from zone two, and watched it fly back over my head, while watching the setter spinning his wheels trying to cross the entire court and hearing that setter yelling "Help! Help!" as the ball was dug straight back to their zone four. It looks ok when a hit comes from zone four cross court to be dug straight back to their zone two, so the setter has a chance, but it is still a hidden negative error.

The New Traditions

Teach your players from the very beginning to make the positive error first and always if they err, by digging the ball up to themselves. Now when someone hits at game speed, the ball simply goes up higher on their side of the net. No low worm burners fly by. Indeed, it is better to dig a ball too high, rather than too low, so on slow balls, we teach adding to these slower flying volleyballs by popping the ball up high, giving one's teammates time to get to the ball. At the same time you want to learn to dig the ball towards a target on your side, but never over the net. So alternating pepper, where the hitter moves forward to be the setter /target half way between where they hit from and the ball is being dug, is a good option. So is three person pepper, where the players weave and move, create positive habits of digging the ball up half way in front of them or to one or the other side to their 3rd partner who is the setter at that moment, and never back to the hitter,

Blocking

The Tradition is to block standing on a platform, or block a coach who is on a hitting box, or "shadow" block. Let's imagine you and I become the world's best shadow blockers. What are we learning to do? To jump at the same time as the hitter, to not penetrate over the net, to block the ball, and to block in front of the hitter. So when we get in the game, we jump too early, (for the ball takes time to go from the hitter to our spot at the net, and the further back they hit from the later we must jump), we touch the net (as there is no one stopping our pressing but ourselves now), we don't know how to penetrate over the net, we watch the ball for timing (as it is the only thing moving) and we fail to take the favorite shot of every hitter around the world, the cross court hammer.

The New Traditions

Simply block live hitters, learning to watch the intelligent thing, the hitter, and not the air filled empty volleyball. The negative error is to net, or get tooled, the positive error is to not block a hitter who you think does not deserve a block (or where the set is not good enough for an aggressive attack to be mounted), or have your block be late, so you deflect the ball up, or to have to dig a ball since it was not blocked. Blockers must learn to watch the attacker as early as possible, preferably while they are starting or just into their approach. The only way to time a hitter is to practice blocking live hitters, hitting from all over the court.

Other Skills

Now, there are coaching negative errors as well. Disgust when they hit the back wall or out long, disappointment

when the ball is passed off the net or set well of the net, frustration with “for gosh sake just hit it in!” statements when the players are being aggressive as they learn mastery and hitting the ball, are errors that bring a team to the negative side of the game. You must show consistency in practice and game reaction, you have to focus on mastery, not the performance and praise the effort and learning along the way, despite the outcome.

I give a player a Wendy’s Frosty for anytime a ball below a player’s waist is dug up “too high” and hit the ceiling. We still get to play it of course, reading the rafter bounce and chasing it down. The point is, digging up too high is what we want all players to do in stress, so their teammates have time to get to the ball instead of watching it fly by and say, “gosh, good effort.” I have hung black sheets over the net not for the fun game of “blind” volleyball, but to make my point that, when you are lost in space, whirling and confused on the court and but having to send the third contact over the net, make the good mistake and hit into the light. That is the space from 7-8 feet off the floor (i.e. the top of the net) to the ceiling and it is NOT the “black hole” from the top of the net down to the floor. When you are confused, hit the ball into the light above the black hole, as it is 2-5 times bigger of a space than from the net down. Even if you hit out, you make them think, but you never will win if you hit lots of balls into the black hole.

Another reason for these positive errors to be the training focus at practice is that the players will practice at home alone or with a friend. They will get tens of thousands of contacts against a wall or back and forth to a partner. From this common “bad miss” promoting training, when they walk into the gym, and we have a net and four or more players, it is time to work on the game like perfection we seek, while making everything a good miss, should we err.

ACL Saver

If I still have you this far into this article, I have one final tradition changing request to make. That is to help teach the players to use their non-dominant hand to attack, each and every practice, even if only for 1-2 minutes a training. Why? To save kids’ ACLs, their anterior cruciate ligaments. The most common knee injury to right handed players is to their left knee. This occurs when a player who only knows how to use their right hand in spiking, jumps to hit balls in games and drills from the number four “outside hitter” position, the most common attack in volleyball. When a player misjudges the ball, and the setter makes the negative error of setting past the antenna, the hitter will lean over to their left to get into a position in the air to hit the ball with their right hand. They then land, and “bam” in one error, their left knee cannot take the stress of landing off balance and they pop their ACL. I hope you take time to develop each player’s non-dominant hand, not necessarily to powerfully attack the ball, but at least to be able to cut a ball outside their body to the other side of their body, the shot they will need to use to save a ball past the antenna, into the opponent’s court, without hitting the antenna. This same non-dominant hand need exists for lefties too, just from zone two, which would be cut across their body to zone two on the other side.

It is interesting to me, that when I work with other sport programs, the expectation is clear that the athletes should be able to use both their right and left hands. In basketball, you must know how to dribble and even shoot with both hands; in soccer you must know how to do the same with both feet. In lacrosse, if you only can shoot right, you will never be any good. Yet in volleyball, we expect the player to hit the ball with their dominant hand no matter how off balance that might make the player.

Please help teach your players how to use their non-dominant hand in play. Play short court warm ups and only allow non-dominant serves and attacks. Point out when they are getting near too far of a lean to their opposite side, and how they can use their other arm to stay more balanced in landing. It only takes one error in judgment to get injured in any sport and for our game, we need to give them more tools to deal with the random, chaotic, angle changing, variable ball flights and speeds that come from rebounding the ball in such a crowded court space.

In many ways, this comes down to a form of “risk management” which is what Hugh McCutcheon used so well to propel the USA Olympic men to a gold medal in Beijing. Rather than rip every serve, if you don’t toss it perfectly to yourself, get it over and in, rather than erring, just take a little bit off it and keep it in play. If you toss it well, go for it. The USA men passing target is 2 meters OFF the net, and their digging target is the center of the court, 4.5 meters OFF the net. Positive errors first and always win medals!

Perception, anticipation and reading, the elements of being a savvy game player, can be taught through play. All the research notes that it is best to teach the whole, rather than the part/progressions, as the game teaches the game. Decision making and learning to win, it comes best through game play, small team size to full six vs. six, but always game play with the decisions of “what is best here” being made each time. Unstructured play helps problem solve new situations as well. Thus your players never want monarch of the court games to end and the wise coach helps create fun and varied scoring games to strengthen that passion to play. It really is simple, a volleyball player plays; if you want your athletes to become great volleyball players, play the game.

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