ITF Coaches Education Programme

Coaching Beginner and Intermediate Players Course

Skill acquisition and expertise development in beginner and intermediate players

Skill acquisition

- Skill acquisition is concerned with optimising the development of players' skills so that they are functional, effective and pressure resistant

WHAT ARE MOTOR SKILLS?

- A motor skill can be considered any activity that involves the body, or select body parts, to achieve a specific pre-determined goal.

- Motor skills can represent individual physical tasks (i.e. a tennis forehand), or be used to describe a level of performance (i.e. Roger Federer is highly skilled)

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CLASSIFICATION OF MOTOR SKILLS AS TASKS

- **Movement organisation**:
  - Discrete skill: The action is usually brief and has a well de! ned beginning and end.
  - Serial skill: The action comprises of several discrete skills put together in a sequence.
  - Continuous skill: The action is repetitive or rhythmic and there is no recognisable beginning and end.
- **Importance of motor and cognitive elements**:
  - Motor skill: The primary determinant of success is the quality of the movement produced.
  - Cognitive skill: The primary determinant of success is the quality of the performer's decision (i.e. regarding the action to be taken).
- **Level of environmental predictability**:
  - Open skill: Performed in an unpredictable environment and that requires performers to adapt their movements in response to the dynamic stimuli.
  - Closed skill: Performed in an environment that is predictable and that allows performers to plan their movements in advance.

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CHARACTERISTICS OF MOTOR SKILLS

- **Maximum certainty**:
  - Achieving goals with a high degree of certainty, on demand and without a reliance on "luck".

- **Minimum energy expenditure**:
  - Minimisation, and occasionally conservation, of the energy required for performance.

- **Minimum movement time**:
  - Reduced time or increased speed with which the goal is achieved.

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WHAT ARE ABILITIES?

- Abilities are stable, enduring traits that, for the most part, are genetically determined.

- They underpin an individual's skilled performance, and cannot typically be improved through practice.

- It follows that where a commentator's reference to a certain player's tennis "ability" is too general, that player may possess greater innate athletic "ability"(or athleticism)

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Coaches should consider the following...

- Players possess different patterns or amounts of abilities.
- Other factors that affect skilled performance are:
  - type and amount of previous movement experience,
  - body configuration,
  - achievement motivation,
  - competitiveness, willingness to take risks,
  - vigour
- Different abilities influence the performance of individual skills, or the same abilities affect individual skills to varying extents.
- As players prefer to experience success rather than failure, there exists the tendency to repeat only the movements in which they demonstrate the most skill.

Coaches should consider the following...

- Beginner players tend to source more cognitive abilities when performing tasks than higher level players.

- The patterns of abilities underlying successful performance change with practice

- Players who perform well in early practice may not be the same individuals who later excel.

Differences between abilities and skills

Abilities	Skills
- Inherited traits. - Stable and enduring. - Few in number. - Underlie the performance of many different skills.	- Developed with practice. - Modified with practice. - Many in number. - Depend on different subsets of abilities.

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Motor learning and performance

- Motor performance is the observable attempt of an individual to produce a voluntary movement or action, or a motor skill.
- It is influenced by many factors such as motivation, attentional focus, fatigue, physical condition, arousal, etc.
- It constitutes the execution of any one of the game's motor skills (i.e. from a task as simple as a split step to one as complex as the serve).
- Motor learning can be inferred by observing relatively stable and improved levels of motor performance.

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MOTOR PROGRAMMES

- When players perform slow and deliberate motor skills they use closed-loop control processes, which involve error detection and correction, including feedback, to achieve the desired goal.

- With less time to process information or when needing to execute motor skills at high speed, they use open-loop control processes.

- These processes do not utilise feedback, rather involving the use of centrally determined, pre-structured commands sent to the muscles.

- This set of motor commands defines the basics of the performed motor skill and are termed a motor programme.

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MOTOR PROGRAMMES AND TENNIS

- The execution of most tennis strokes present examples of open-looped processing, where the motor programmes determine the sequence and timing of muscle contraction.

- Once learned, these programmes are stored in long-term memory and retrieved as required.

- This has an obvious benefit in that comparatively less attention or movement organisation is needed for movement production.

- Open-loop control allows the motor system to organise an entire action ahead of time.

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MOTIVATION

- Motivation is key to successful learning.
- Motivated players:
  - exert greater effort,
  - are more persistent and
  - more conscientious during practice than less motivated players.
- Motor learning contexts are achievement oriented.
- Players need **achievement motivation**, which is a measure of the direction and intensity of a player's effort to reach a performance goal either for task mastery or for surpassing others.
- Players can then judge their success according to:
  - their own performance of the task (task-oriented) or
  - The performance of others (ego-oriented).
- Players high in achievement motivation will continue to be motivated as long as they feel competent or are successful

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Guidelines to enhance achievement motivation

- Involve players in the goal setting process.

- Set aside time to work on players' strengths and weaknesses.

- Involve players in the evaluation process.

- Create a task-oriented motivational climate.

- Organise fun and varied practices.

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STAGES OF SKILL LEARNING

	Early stage of learning	⟷	Later stage of learning
General features	Cognitive (trial and error) Verbal motor (more talk) Getting the idea of the movement Co-ordination (acquire the pattern)	Associative (homing in) Beginning to build motor programmes, with movements becoming "grooved" and more "stable" Discovery of regular features in the environment (e.g. ball, opponent)	Autonomous (fee and easy) Motor (more action) Combination of fixation / diversification (closed or open skill) Control (adapt the pattern as needed)
Movement characteristics	Stiff looking Inaccurate Inconsistent Slow, jerky Timid Indecisive Rigid Inefficient Commits many errors (i.e. error creation)	More relaxed More accurate More consistent More fluid More confident More decisive More adaptable More efficient Commits fewer errors (i.e. error reduction)	Automatic Accurate Consistent Fluid Confident Certain Adaptable Efficient Minimises errors (i.e. error detection and management)
Learning strategies	- Considerable time spent problem solving due to the unfamiliar nature of the task. - Gains in performance proficiency tend to be rather large and occur rapidly. - Instructions, demonstrations and other types of verbal and visual information are beneficial. - Use of transfer or learning (i.e. learning from one situation assists learning in another).	- Practice largely dedicated to refining, modifying, and adapting patterns, often to environmental demands: ○ **Closed skills**: developed through repetition in fixed situation ("fixation"). ○ **Open skills**: developed through rehearsal experiences in diverse situations ("diversification"). - Typically lasts longer than the cognitive stage (several weeks or even months). - Instructions and feedback become less important; however the feedback provided needs to be more precise.	- Achieved after extensive practice. - Little or no attention needed to execute skills. - Able to detect and correct motor errors. - Motor programmes developed and used for longer periods of time. - Increased automatic processing in the awareness of environmental patterns (e.g. opponent's movements). - Performance improvements more difficult to detect as players begin to reach the limits of their capabilities.

Primary characteristics of the different learning styles

	Visual	Auditory	Kinaesthetic/physical/tactile
Preferred learning channel	Seeing and reading, including pictures, diagrams, demonstrations, displays, handouts, films, flip-chart, etc.	Listening and speaking using sounds and noises.	Touching, holding and doing, feeling physical and practical hands-on experiences.
Recommended teaching strategy	Write instructions.	Explain verbally.	Demonstrate and let them have a go.
Typical verbal communication	"I see what you mean". "Show me". "Watch how I do it".	"I hear what you are saying". "Tell me". "Listen to me". "Explain".	"I know how you feel". "Let me try". "You have a go".

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STAGES OF
INFORMATION PROCESSING

Input	Stages of processing			Output
	Stimulus identification (perception)	**Response selection (decision)**	**Response programming (action)**	
This is the stimulus or information that players receive for processing (e.g. the oncoming ball).	Players recognise and identify the input from a variety of sources (senses) and create a representation of the environmental information.	Players decide what, if any, motor response should be made. The response will be selected from a list of available movements.	Players organise the central nervous system (i.e. brain and spinal cord) to direct the appropriate muscles to contract at the right time and with the right intensity to produce the desired motor response.	The motor response (e.g. stroke) produced as a result of the information processed.

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Sensory contributions

- Information that can be used to produce skilled movements such as tennis strokes arises from several sources:
- **Exteroceptive information**:
  - Sensory information derived from sources outside an individual's body, and that is largely provided for through vision and audition.
- **Interoceptive information**:
  - Sensory information from sources within an individual's body such as the vestibular apparatus, muscle spindles, Golgi tendon organs, and cutaneous receptors.
  - From a motor control perspective, the most important types of this information are:
    - **Proprioception**, which signals body and limb positions.
    - **Kinesthesis**, which signals muscle contraction and limb movements.

Anticipation

- Players can reduce their time spent making decisions by using the information available to anticipate or predict an opponent's intent.
- Anticipation can be classified as:
  - **spatial (or event) anticipation** (the capacity to predict what is going to happen in a performance situation)
  - **temporal anticipation** (the capacity to predict when something is going to happen in a performance situation), and is affected by the regularity of the events as well as a player's level of motivation, arousal, anxiety and stress.
- On- and off-court anticipation/perception training improves:
  - decision-making (i.e. predicting shot locations),
  - response times, and
  - stroke accuracy
- Strategies to hinder a player's capacity to anticipate include:
  - variation of both spatial and temporal movements
  - performance of "fakes".

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Arousal and anxiety
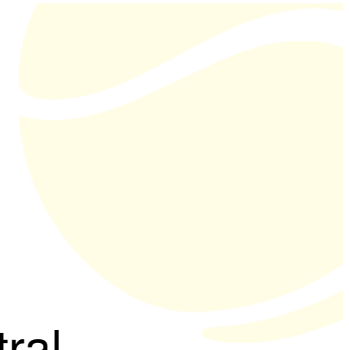
- **Arousal:**
  - It represents the level of activation or excitement of the central nervous system.
  - It can vary from being extremely low, as in sleep, to extremely high, like when performing intense physical exercise.
- **Anxiety:**
  - The distress and uneasiness of an individual about future uncertainties or the emotions that one associates with the perception of a threat to the self, which in turn, tends to be linked to increased arousal.
- **Trait anxiety:**
  - General disposition of individuals to perceive situations as threatening.
    - If players see themselves as capable of meeting the challenge or understand that their performance is not evaluated, anxiety and arousal levels decrease.
    - If players perceive the demands of the task (e.g. match) as exceeding their capabilities or feel that their performance is being evaluated, their anxiety and arousal levels will increase.
- Heightened arousal can affect information processing in a variety of ways; none of which enhance performance.

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Attention

- Focalisation on the information-processing resources (Schmidt & Wrisberg, 2000).
- Humans have finite attentional capabilities which curtail their capacity to process information.
- Players are exposed to an abundance of information that can fill their attentional space and require processing.
- Some of the information...
  - is relevant (e.g. the flight of the ball) whereas
  - a lot is not (e.g. the audience).
- The challenge for players is to:
  - effectively manage their attentional space
  - determine what cues:
    - should be attended to,
    - when and how they should be interpreted.

Attention
- parallel processing

- The attention of players can be challenged when they have to perform two tasks simultaneously.

- It occurs during the stimulus-identification stage

- Allows players to deal with two or more streams of information at the same time:

  – the opponent has hit a dropshot, and is approaching the net.

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Attention
- controlled processing

- Controlled processing is slow, serial, attention demanding, and voluntary type of information processing.

- It occurs:
  – during the response selection stage and
  – in the early stages of learning
  – for example when a beginner player tries to hit a forehand.

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Attention
- automatic processing

- Automacity:
  - Type of information processing which is fast, parallel, neutral, and involuntary
  - Is a product of considerable practice that allows skilled players to handle particular information-processing tasks in virtual automatic fashion.
- Can be practised using consistent stimulus-response conditions in which a given stimulus pattern (e.g. a short ball) always requires the same response (e.g. approaching the net).
- If players practice using varied stimulus-response conditions in which a given stimuli pattern (e.g. a short ball) requires different responses at different times (e.g. 15-0 or 40-30) or in different situations (e.g. When the opponent is at the net or is at the baseline) they will need extensive practice to develop automatic processing.

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Attentional focus

- Act of directing attention to information sources or to objects (e.g. the ball), and is controlled in two dimensions (Nideffer, 1992):
  - Direction:
    - External focus: The act of attending to sources of information in the environment (e.g. opponent, ball, spectators, etc.).
    - Internal focus: The act of attending to sources of information inside the player (e.g. feelings, thoughts, etc.).
  - Width:
    - Narrow focus: The act of attending to narrow range of information (or small number of cues) at one time (e.g. contact point, elbow position, etc.).
    - Wide focus: The act of attending to wide range of information (or large number of cues) at one time (e.g. opponent's court, weather conditions, etc.).

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Movement accuracy

- Crucial to tennis play as it is intimately linked to the skill level of the player.
- Two types of accuracy in tennis:
  - **Spatial**: This is crucial where spatial position of the movement's end point is important for task performance (e.g. hitting the ball inside the court).
  - **Temporal or timing**: This is key where precision in movement timing is important for task performance (e.g. hitting the ball).

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Type	Characteristics
Visual / Spatial Intelligence	• Ability to perceive the visual. Tend to think in pictures. • Need to create vivid mental images to retain information. • Enjoy looking at maps, charts, pictures, videos, and movies.
Verbal / Linguistic Intelligence	• Ability to use words and language. • Highly developed auditory skills. Elegant speakers. • Think in words rather than pictures.
Logical / Mathematical Intelligence	• Ability to use reason, logic and numbers. Think conceptually in logical and numerical patterns. • Curious about the world around them. Ask lots of questions. • Like to conduct experiments.
Bodily / Kinaesthetic Intelligence	• Ability to control body movements and handle objects skilfully. • Express themselves through movement. Good sense of balance and eye-hand co-ordination. • Are able to remember and process information through interacting with the space
Musical / Rhythmic Intelligence	• Ability to produce and appreciate music. • Think in sounds, rhythms and patterns. • Extremely sensitive to environmental sounds.
Interpersonal Intelligence	• Ability to relate and understand others. • Ability to sense feelings, intentions and motivations. • Great organisers, try to maintain peace in group settings and encourage co-operation. Try to see things from other individuals' points of view. • Use both verbal and non-verbal language to communicate with others.
Intrapersonal Intelligence	• Ability to self-reflect and be aware of one's inner state of being. • Try to understand their inner feelings, dreams, relationships with others, and strengths and weaknesses.

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INTELLIGENCE

PRACTICE
Preparation

- Players
- Goal setting
- Goal(s) of learning
- Stage of learning
- Transfer of learning

- Target skills
- Target behaviour
- Target context
- Performance measures

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PRACTICE
Schedules

- **Massed practice**:
  - The amount of rest between practice attempts or between practice sessions is relatively shorter than the amount of time spent practicing.

- **Distributed practice**:
  - The amount of rest between practice attempts or between practice sessions is relatively longer than the amount of time spent practicing.

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PRACTICE
Rehearsal of several distinct tasks

- Blocked practice:
  - A practice sequence in which players repeatedly rehearse the same task and then shift to another task.
  - Drills during which players repeat the same stroke or movement for a considerable period of time
  - e.g. 10 minutes of serving, 10 minutes of forehands, 10 minutes of backhands, and so on.

- Random practice:
  - A practice sequence in which players perform a number of different tasks in no particular order, thus avoiding or minimising consecutive repetitions of any single task.
  - Drills often see players rotate continually, arbitrarily performing different strokes or movements
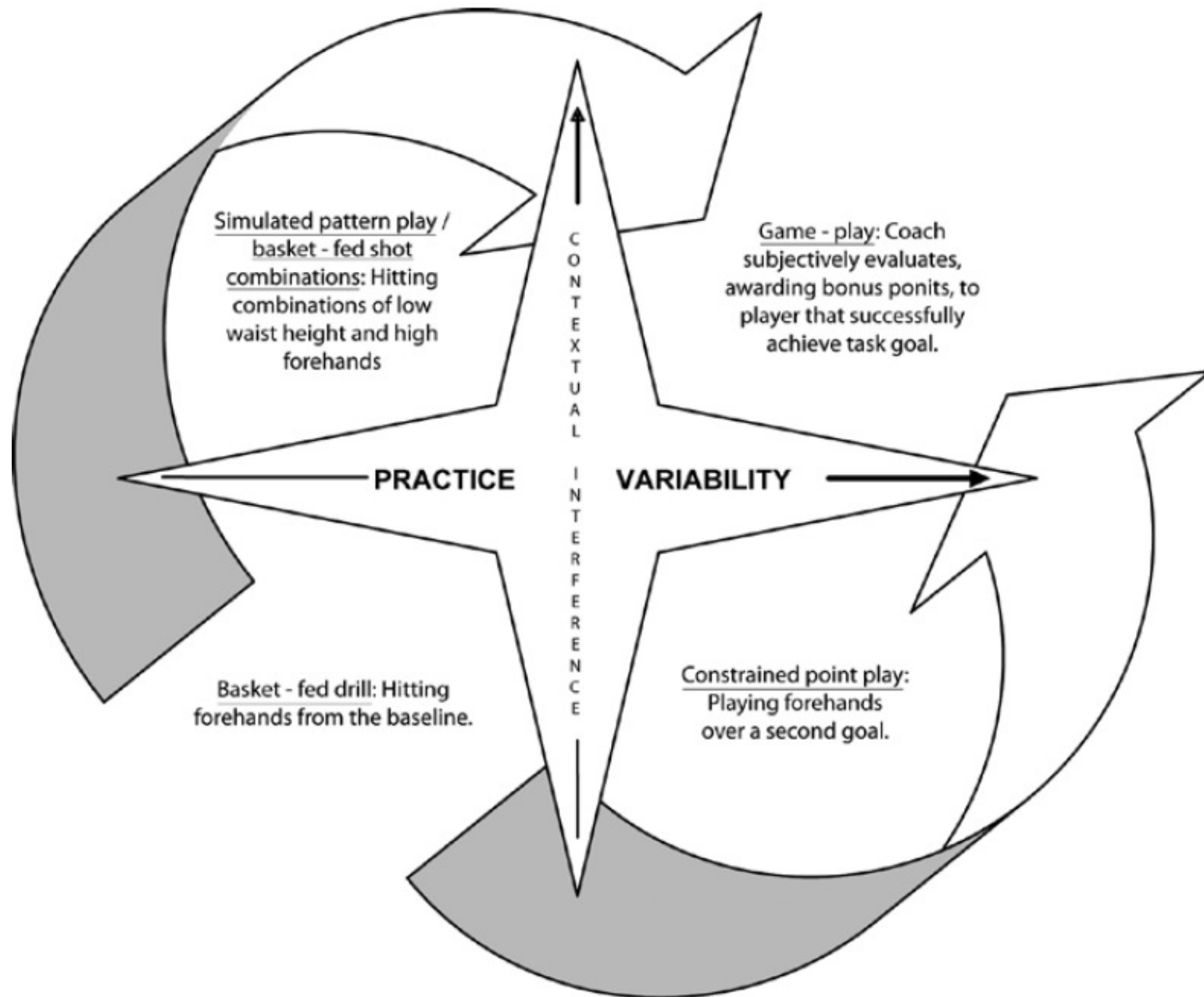 - e.g. A drill consisting of 1 serve, 2 forehands, 2 backhands, etc.

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PRACTICE
Random vs. Blocked

Characteristic	Random practice	Blocked practice
Context conditions	Varied	Stable and constant.
Problem solving process (creativity)	Requires the generation of a solution on each stroke.	Requires the generation of a solution only on the first stroke.
Chance for success – decision making	Allows only one chance for success.	Provides many chances for success.
Movement repeatability	Same movement is not repeated on successive attempts.	Same movement is repeated over and over again.

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PRACTICE
Rehearsal of variations of the same skill

- **Constant practice**:
  - Players rehearse only one variation of a given task or class of tasks during a session.
  - If a player's goal is to simply become skilled at hitting forehands down the line, this type of low variability practice is likely beneficial.

- **Variable practice**:
  - Players rehearse a number of variations of a task or given class of tasks during a session.
  - Also referred to as high variability practice, it might be the preferred mode of practice if the goal of a player is to become skilled in all forehand variations.

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Simulated pattern play / basket - fed shot combinations: Hitting combinations of low waist height and high forehands

Game - play: Coach subjectively evaluates, awarding bonus ponits, to player that successfully achieve task goal.

CONTEXTUAL INTERFERENCE

PRACTICE   **VARIABILITY**

Basket - fed drill: Hitting forehands from the baseline.

Constrained point play: Playing forehands over a second goal.

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PRACTICE
Transfer of learning

- The gain or the loss of a player's proficiency on one task as a result of previous practice of or experience in another task

- Types:
  - **Generalisation or near transfer**: Occurs from one task to another very similar task or situation by adapting the target skill to different environmental conditions.
  - **Far transfer**: Occurs from one task to another very different task or situation by learning a fundamental movement activity such as jumping that will help the player future performance in other activities apart from tennis.

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PRACTICE
What to explain / instruct

- General information about the fundamentals of the skill
- Analogy or metaphor.
- How the skill is used in particular situations
- Where and how to move
- How to hold the racquet
- What to pay attention to
- What to do
- Any similarity between skills
- Use of consistent terms for similar skills
- What players might expect when performing a new skill

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PRACTICE
Effective explanations / demos

- Keep the instructions brief and to the point.

- Emphase no more than two concepts at a time

- Relate them to things that the players may have previously learned.

- Space the instructions throughout the first few minutes of practice.

- Provide fundamental information first and then add any specific details.

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PRACTICE
Effective explanations

- Use of language that is understandable to the players
- Use verbal cues to facilitate player understanding.
- Ask players to review the cue words for the movement being practised.
- Focus on start and/or end point positions as they tend to be the most easily identifiable aspects of movements.
- Direct attention toward external effects of action, rather than body parts.
- Use questions to help learners to recognise own errors.

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PRACTICE
Effective demonstrations

- Essential or key characteristics of the skill are emphasised
- Several opportunities to view the original demonstration
- Players should pay attention to the demonstration
- Coaches will likely need to direct learners to what to look for
- Players should be positioned so that they can clearly observe the demonstration.
- Instructions (e.g. verbal cues) complement or reinforce the key characteristics of the demonstration.
- The non-verbal, and accompanying verbal message are compatible and adapted to the players' ages and skill levels.

PRACTICE
FORMS OF REHEARSAL

- Task complexity:
  - **Whole practice** is typically recommended when teaching a simple task (e.g. bouncing a ball on the ground).

  - **Part practice**, on the other hand, is suggested as beneficial when introducing complex tasks (e.g. the tennis serve) as it simplifies the performance.

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PRACTICE
Types of part practice

- **Fractionisation**: Two or more parts of a complex skill are practised separately:
  - Drill 1: The player practises the ball toss for the serve. The ball is tossed in an effort to have it bounce on the racquet (head) which is placed on the ground.
  - Drill 2: The player practises making racquet-ball contact in the serve by hiting a ball hanging from a pole at typical impact height.

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PRACTICE
Types of part practice

- **Segmentation or progressive part practice**: One part of a skill is practised until it is engrained before a second part is introduced, and the two parts are practised together. This continues until the entire skill is practised:
  - Drill 1: The player practises the ball toss for the serve by ensuring that the path of the toss follows the vertical fence post.
  - Drill 2: The player practises the ball toss and contacting the ball in the serve by tossing the ball close to the fence and impacting it against the fence.
  - Drill 3: The player practises the whole serve by standing back from the fence and performing drill 2 (with a follow through) so that the ball is hit against the fence.

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PRACTICE
Types of part practice

- **Simplification**:
  - Slow-motion practice:
    - Replication of the same movement (as in real time) but at a slightly slower speed.
    - Help players consolidate the fundamental movement pattern
    - If the movements are rehearsed at too slow a speed (e.g. a throwing motion that lasts for 20s) the practice is of little value.
  - **Scaled-down equipment**:
    - Balls (e.g. use of red, orange and green), racquets (e.g. mini, junior), courts (e.g. red, orange and green) and nets
    - Adapted to the individual learners to facilitate learning.

	Approaches	
	Prescriptive coaching	**Discovery coaching**
Coach	• To have wide ranging knowledge.	• 'Facilitators' rather than 'dictators' of the learning process.
Knowledge	• To be passed on to the learner.	• Encourage individuals to explore solutions to different movement problems.
Demonstrations and feedback	• Occasional redundant extrinsic feedback and demonstration.	• Only given when necessary.
Instruction	• Explicit instruction, which directs individuals' senses to specific cues.	• Players are encouraged to learn more implicitly.
Application	• It continues to be favoured by many coaches.	• It implies a considerable change by the coaches.
Effectiveness	• May facilitate early skill acquisition.	• Reported as more amenable to development of game intelligence • Helps players 'play' the game.
Critique	• Doubts regarding its effectiveness for long-term performance enhancement and learning. • Develop skills that are less durable to psychological stress than those learned through less prescriptive approaches. • The value in helping players 'play' the game has been questioned.	• Concerns regarding its effectiveness in teaching the correct technical characteristics that underpin game play. • Concerns regarding the need for players to immediately understand game play specially among young beginner players.
Consequences	• Recent popular support of less prescriptive approaches, such as the game-based approach.	• Greater ownership over the individuals own development.

Constraints coaching
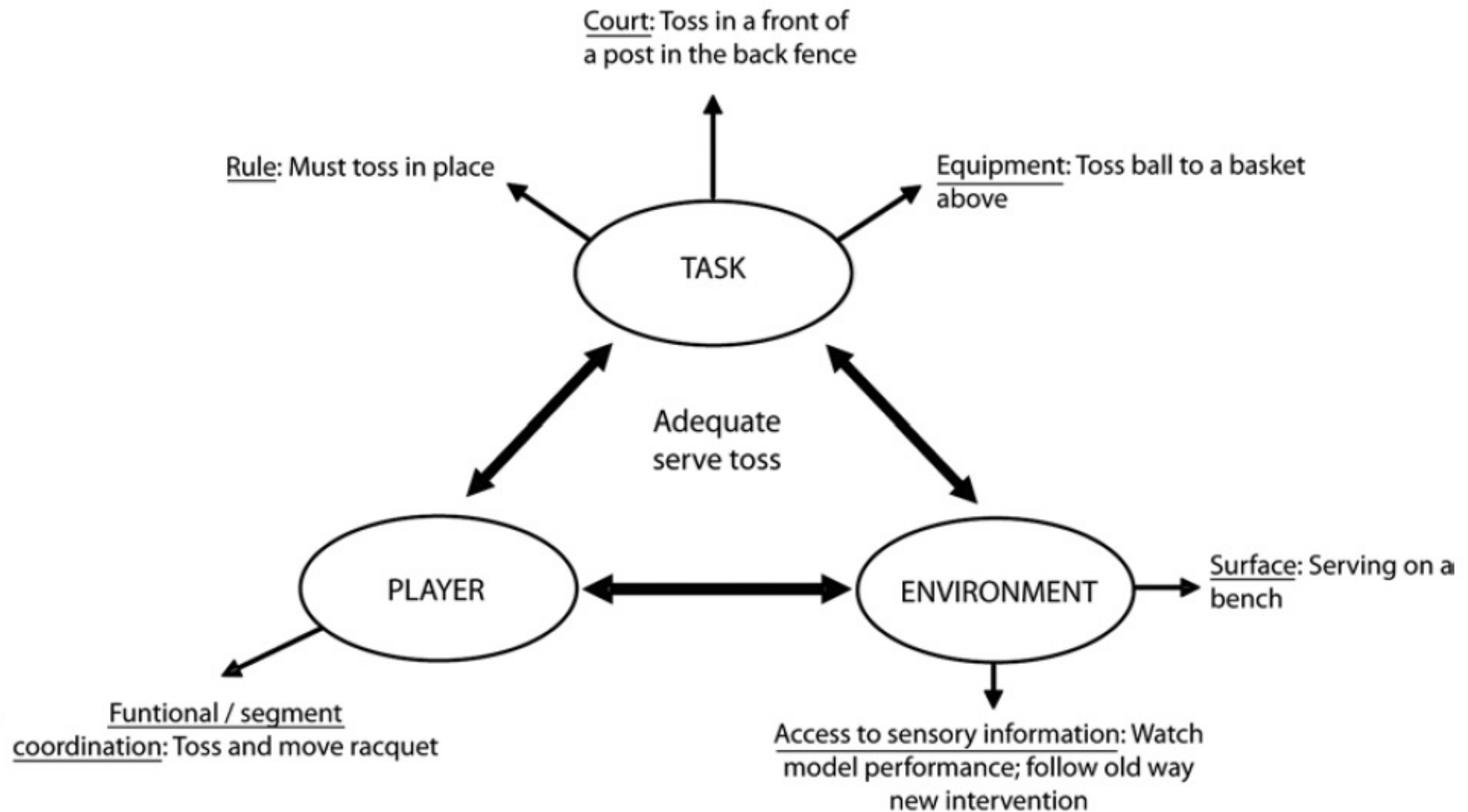
FEEDBACK

- The sensory information, which provides some insight into the actual state of the movement, received by players.

- Types:
  - Intrinsic (or inherent) feedback:
    - is derived from sources outside (exteroception) or
    - within the player's body (proprioception),
    - as players feel, see or hear the consequence of their action.
  - Extrinsic (or enhanced/augmented) feedback can be provided by the coach or through an umpire, a video clip, the match score, statistics, etc.

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FEEDBACK
Knowledge results / performance

- **Knowledge of results:** Usually verbal information that informs players regarding the success of their actions (strokes or movements) with respect to the intended goal. Depending on the information presented, it can be considered:
  - **Redundant:** Contains the same information as intrinsic feedback (e.g. Just long! or: You hit with the frame!), and is thus of little value and can even be irritating for players.
  - **Non-redundant:** Contains different information than that available intrinsically (e.g. When players are unable to see if balls are in or out, the coach calls "Just long!") and is thus of some value.
- **Knowledge of performance:** Usually verbal information that informs players of the quality (displacement, velocity, acceleration, etc.) of their actions (strokes or movements) with respect to the intended goal (e.g. Toss the ball higher).

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FEEDBACK
content

- **General**:
  - Imprecise feedback (e.g. "Good", "Not bad") that does not necessarily identify what is good nor what could be better; or

- **Specific**:
  - Precise feedback (e.g. "Your racquet head was kept well above wrist height during that volley. Excellent. Now be sure to move your bodyweight forwards also.") emphasises what is good and what could be better.

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FEEDBACK
Information

- **Programme**:
  - Feedback that provides players with information on how to improve the fundamental pattern of a movement
  - e.g. "Control your tossing arm", "Keep the wrist firm"

- **Parameter**:
  - Feedback that provides players with information about the amplitude, speed or power (parameter values) they are using to adapt their movement to the requirements of the situation
  - e.g."Run faster", "Contact the ball higher", "Make a longer swing", "Hit the ball harder".

FEEDBACK
Timing

- Coaches are typically recommended to **wait several seconds**, allowing players to process their intrinsic feedback and potentially identify their own errors, before providing any extrinsic feedback

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FEEDBACK
Frequency

- With novice players or during the learning of complex tasks, indications are that feedback needs to be delivered more frequently to improve performance

- Feedback should become less frequent as skills develop; with intrinsic feedback becoming more prominent

- Feedback that is given only occasionally is more effective than feedback given after each performance attempt.
  - **Summary feedback**: feedback provided after a series of performance attempts that can supply the player with information about each attempt in the series
    - a player hits 10 serves and the coach provides feedback on each serve's effectiveness at the end of the series: "6 hit the target, 2 short and 2 long").
  - **Average feedback,** a variation of summary feedback, which details the average performance of the series of strokes upon their completion (e.g. "60% of your serves where in") is considered easier to administer and represents another viable means of presenting intermittent feedback

EXTRINSIC FEEDBACK FUNCTIONS

Type	Characteristics
Motivation	When feedback provides players with information about their progress towards the achievement of their goals. This can be particularly effective when performing boring and repetitive tasks or when players are making only "baby steps" towards achieving their goal.
Reinforcement	When feedback helps to increase the probability that an action is repeated in the future. The combination of complementary verbal and non-verbal reinforcement is likely to provide for most consistent and beneficial changes in performance. Reinforcement can be: • **Positive**: An event that follows the player's response and, due to its pleasant nature, increases the likelihood that the player will repeat the response again under similar circumstances (e.g. The coach says "Well done!" to the player after a good shot). This is the most effective form of reinforcement. • **Negative**: An event that follows the player's response and consists of the removal of an unpleasant stimulus, thereby increasing the likelihood that the player will repeat the response again under similar circumstances (e.g. The coach says "No, no!" to the player after an error, but following a good shot remains silent).
Information	When feedback provides players with information regarding their game play with a view to improving their proficiency. The information can be presented as: • **Descriptive**: Feedback that describes the performance (generally the errors) of the player (e.g. The racquet head was too low in that volley) and generally assumes that players know what to correct in their next attempt. • **Prescriptive**: Feedback that offers guidance (a solution to correct the movement) about the player's performance (e.g. Keep the racquet head high on those volleys). As compared to more descriptive comments, this type of feedback tends to be more useful for players.

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Assessing skill progress

- The goals of the player.
- The characteristics of the action:
  - Outcome measures: Performance observations that point to the end result of performance (e.g. number of serves in during a set).
    - Time
    - Distance
    - Frequency
    - Accuracy
    - Consistency
  - Process measures: Performance observations that point to the quality of the movement produced and may involve the use of sophisticated instrumentation or other expertise:
    - Three-dimensional (3D) optophotogrammetry
    - EMG: Electromyography
    - EEG: Electroencephalography
    - Expert's ratings of movement forms

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