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Principles of effective curriculum design for sports coaches

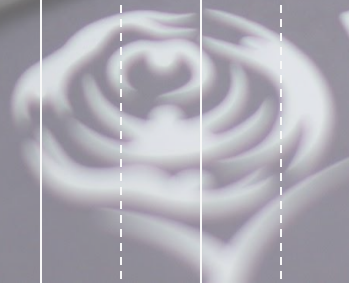
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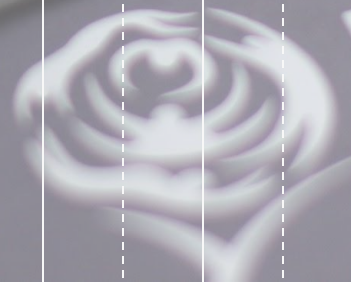
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Outline

- Preliminaries
- Step 0: Defining sport
- Step 1: Mental model
- Step 2: Performance model
- Step 3: Curriculum
- Summary and exemplars



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Preliminaries 1: coach decision-making



Preliminaries 2: best practice?



ENGLAND
HANDBALL

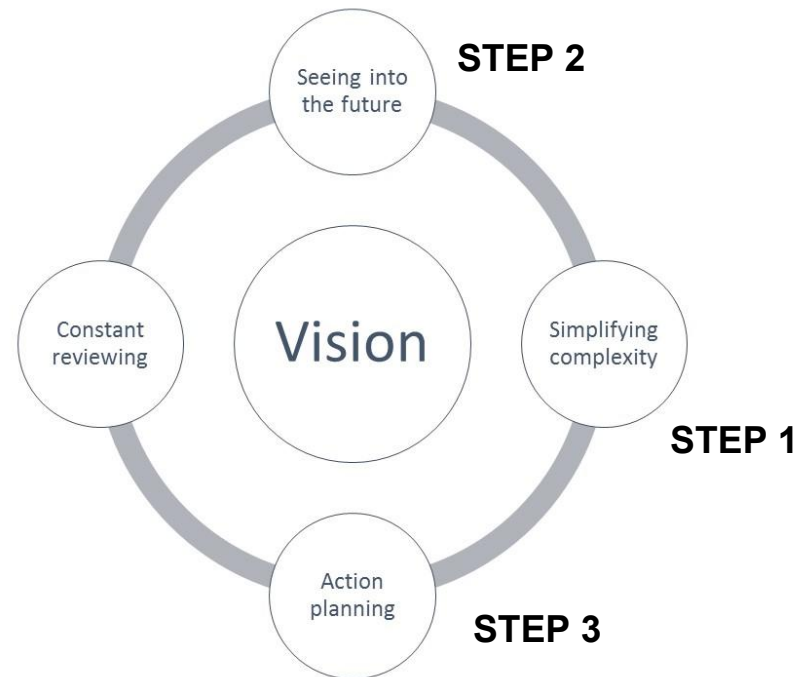
Preliminaries 3: importance

TABLE 6.2 Levels of Competence and Responsibility in Coaching

Functions	Competences	Coaching Assistant	Coach	Advanced/ Senior Coach	Master/ Head Coach
Set the vision and strategy	Understand big picture	Yellow	Green	Blue	Orange
	Align and govern	Yellow	Green	Blue	Orange
	Analyse needs	Yellow	Green	Blue	Orange
	Set the vision	White	Yellow	Blue	Orange
	Develop strategy	White	Yellow	Blue	Orange
Shape the environment	Create action plan	White	Yellow	Blue	Orange
	Organise setting and personnel	Yellow	Blue	Blue	Orange
	Identify and recruit athletes, staff and resources	Yellow	Green	Blue	Orange
	Safeguard participants	Blue	Blue	Orange	Orange
	Develop progress markers	White	Yellow	Blue	Orange
Build relationships	Lead and influence	White	Yellow	Blue	Orange
	Manage	White	Green	Orange	Orange
	Manage relationships	Yellow	Green	Blue	Orange
	Be an educator	White	Yellow	Blue	Orange

International Sport Coaching Framework v1.2
ICCE, ASOIF and LBU (2013)

Qualities of Serial Winning Coaches
Mallett, C. & Lara-Bercial, S. (in press).



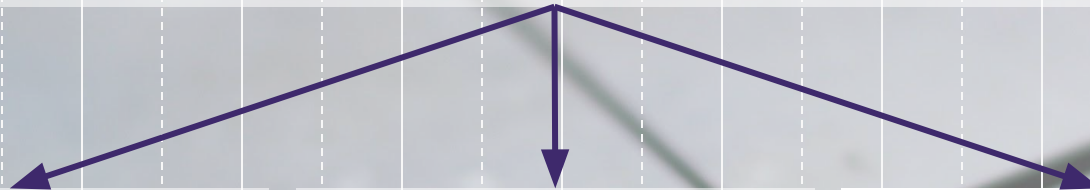
The cornerstone concept

Bruner's "Spiral Curriculum"

"If the understanding of number, measure and probability is judged critical in the pursuit of science, then instruction in these subjects should begin... as early as possible in a manner consistent with the child's forms of thought. Let the topics be developed and redeveloped in later grades... Many curricula are originally planned with a guiding idea much like the one set forth here. But as curricula are actually executed, as they grow and change, they often lose their original form and suffer relapse into a certain shapelessness." (Bruner, 1977: p. 54)

STEP 0: defining sport

“A goal directed activity where the goal is pursued using means permitted by the rules that prohibit more efficient in favour of less efficient means” (Suits, 1978: p. 48)



Prelusory Goal

What is the abstract goal (desirable ends) of the sport? (e.g. to cross the finish line ahead of opponents)

Constitutive Rules

What are the main rules that prevent the goal from being reached by the most efficient means?

Lusory Means

What are the means permitted by the rules and effective in meeting the goal?

Lusory means and 'internal logic'

'the product of the continuous interaction between the main rules (and goals) and the changing responses produced by players' (Grehaigine et al., 2005: p. 3)

Family	Category	Basic 'internal logic' Emerging from interaction of goal-rules-opposition
Games	Territorial/Invasion	Scoring/conserving; recovering/defending
	Striking/Fielding	Making risk/reward calculations
	Net/Wall	Creating/reducing time and space
	Target	Judging speed, angle and trajectory
Non-games	Aesthetic sports	Tariff and execution balance
	Combat sports	Defence/attack transition
	Athletic (motor) sports	Faster, higher, stronger (further)

Step 1: developing a mental model

Goal: identify the main tactical problems of the sport

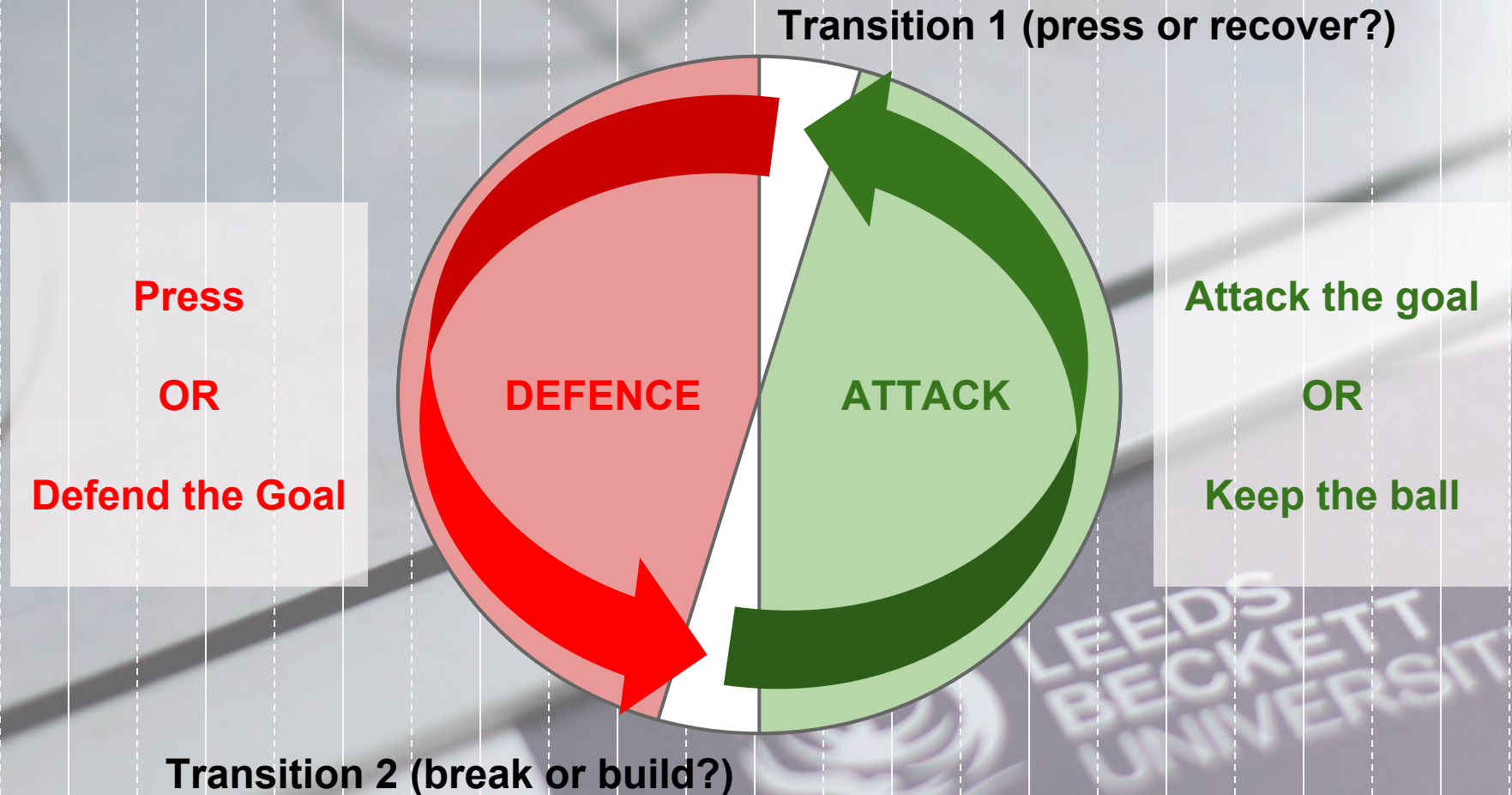
Three approaches (best when combined):

- 1) Inside-out/internal logic (see boxing example, below)
- 2) Top-down/deductive (use or adapt an existing model)
- 3) Bottom-up/inductive (analyse patterns of play in your sport)

Goal	Rules preventing easy solution	Tactical problems	Technical solutions
Knock your opponent out or force them to retire hurt (or score more points via aggression and accuracy)	“stand-up match in a 24-foot ring” “rounds of three minutes duration”	Reduce opponent’s escape routes	Economical and balanced footwork
	“no wrestling or hugging allowed”	Judging distance	Solid stance and guard
	“a blow struck below the waistband shall be deemed foul”	Finding gaps in opponent’s guard	Sharp and accurate combinations of punches and fakes

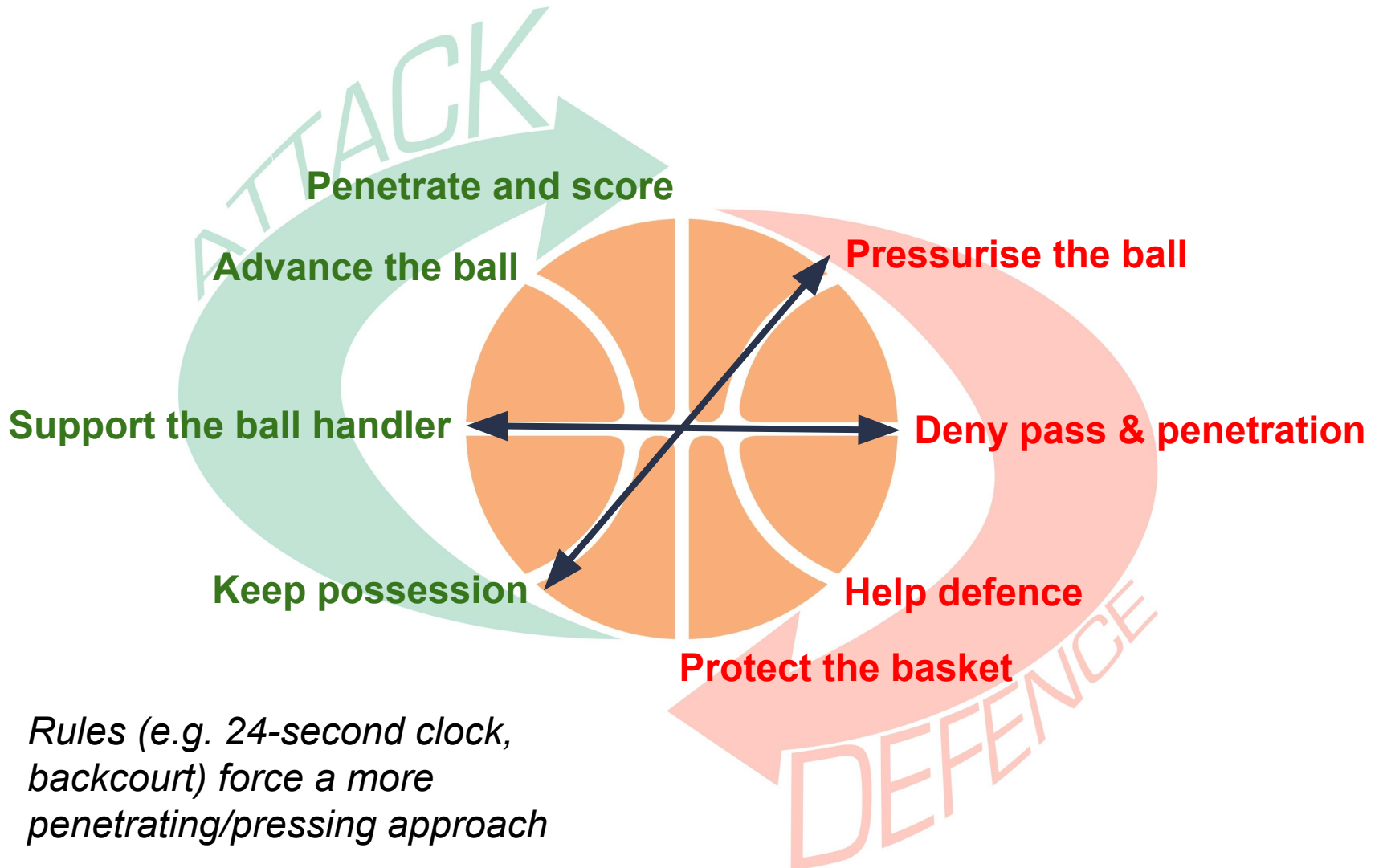
Simplifying complexity in invasion games

Model: 'the *components* of a *complex* system and the *relationships* between those components' (Lyle, 2002)



Mental model example

Paired opposites of fundamental tactical problems in basketball



Step 2: developing a performance model

GOAL: to describe 'target performance' in the fundamental tactical problems specified in the mental model

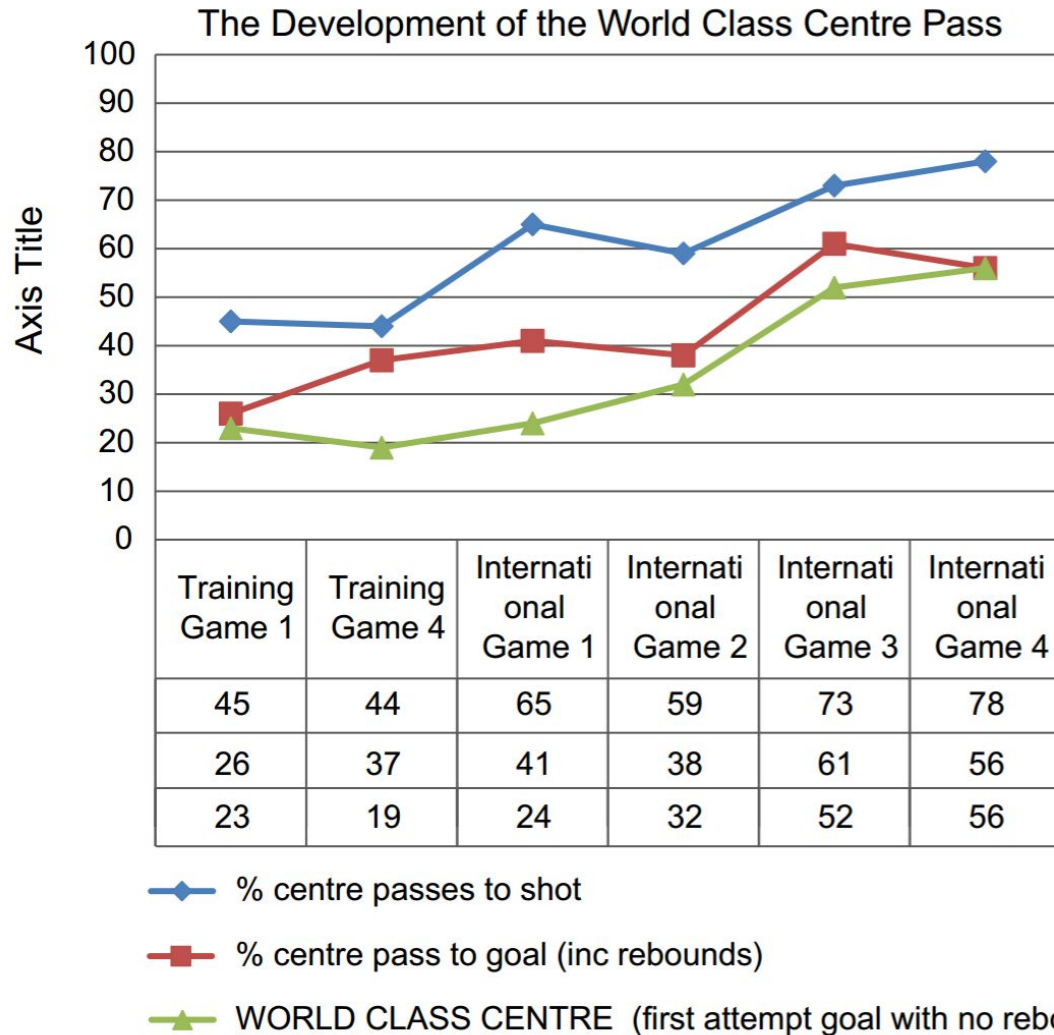
1. What kinds of performance solutions (tactical and technical) are required at the target level? (e.g. how quickly is the ball recovered after a turnover?)
2. What physical and psychological capacities underpin the execution of the performance solutions? (e.g. what is the average wingspan-height ratio?)

Clear, shared performance models are a feature of successful teams, in sport and business (Giske et al., 2015)

Developed using observation and 'analytics' (see next)

A contained example in netball

(Richards et al., 2012)



Isolated an important controllable part of the game (centre pass)

Analysed Aus and NZ in execution of world-class centre pass

Developed a shared mental model of the desired performance ('alpha version') (e.g. 50% world-class)

Practiced and generated performance feedback

Aspirational but realistic

(e.g. NCAA Div 1 - recruit players from this level already, would like to produce)

Basketball

THEME: Pressurise the ball

Tactical

Team aggressively and consistently force opponent away from strengths and intentions

Technical

Players have robust low-wide stance; strong upper-body bumping to unbalance attacker; cuts-off dribble with lightning shuffle and recovery steps; active hands to disrupt pass or shot



Step 3: developing a curriculum

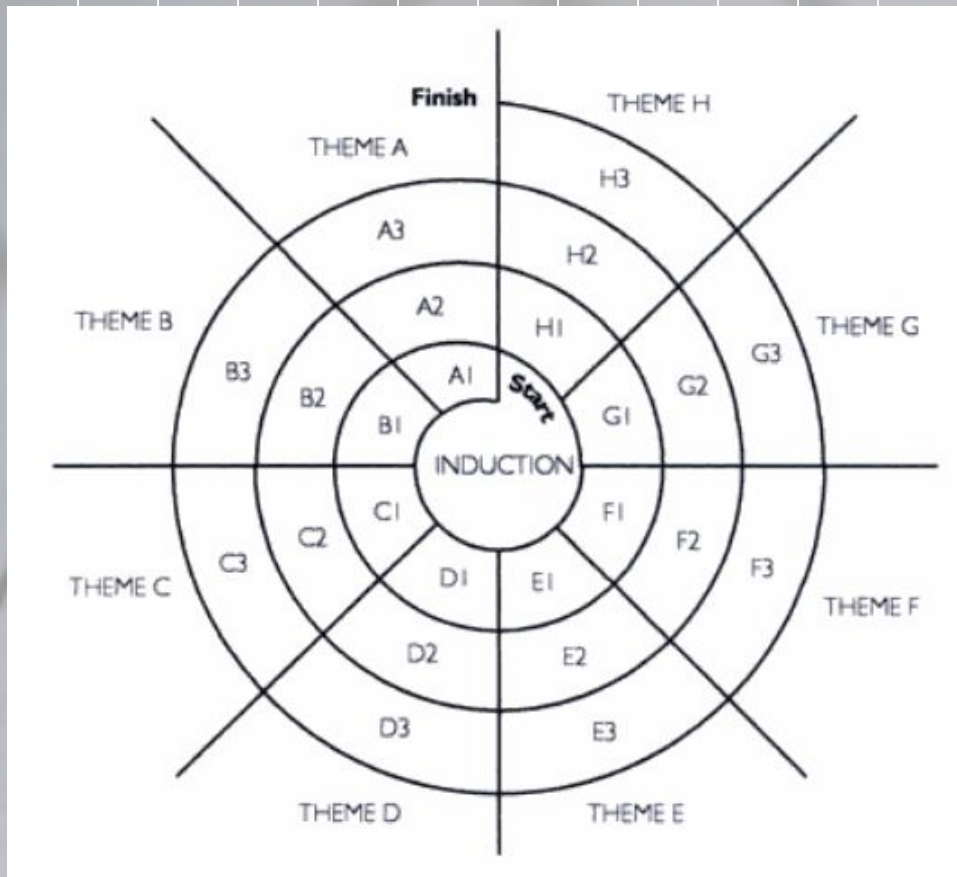
GOAL: develop broad but clear end-of-stage outcome statements for participants in tac/tec/phys/psych domains and relevant core developmental activities

Understanding of [bio-psycho-social development](#) can help to 'calibrate' expectations at different stages e.g.:

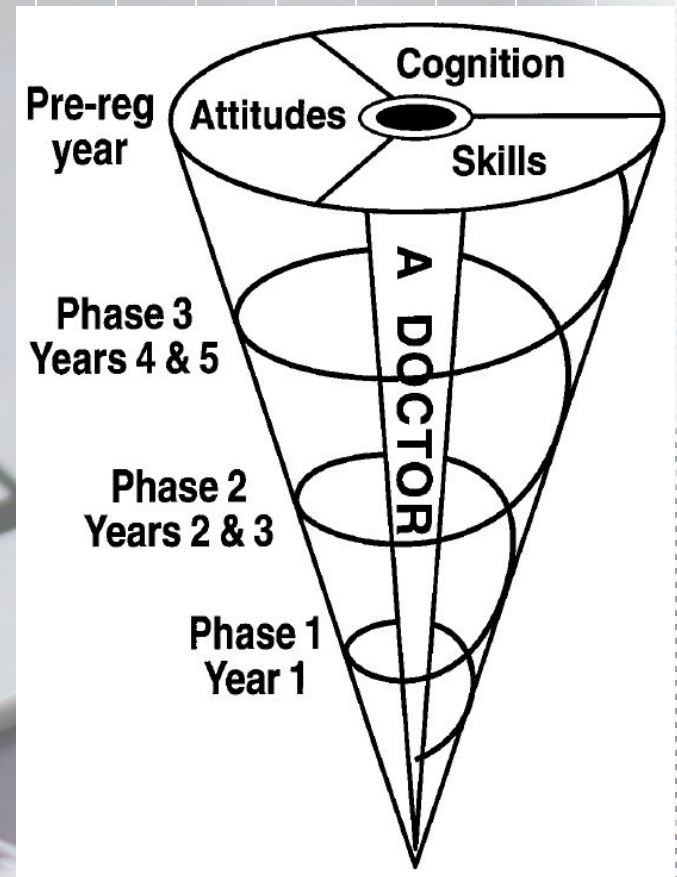
- When are young people strong enough to throw a half-court pass? (implications for when to introduce full-court press defence)
- When do young people stop being egoistic? (implication for when to focus on off-ball offensive movement, such as screens)

Structured around the TTMM with the PM as exit-level performance, then work backwards (i.e. what techniques underpin x? Can they be developed given the developmental stage of the players?)

'Spiral Curriculum' design

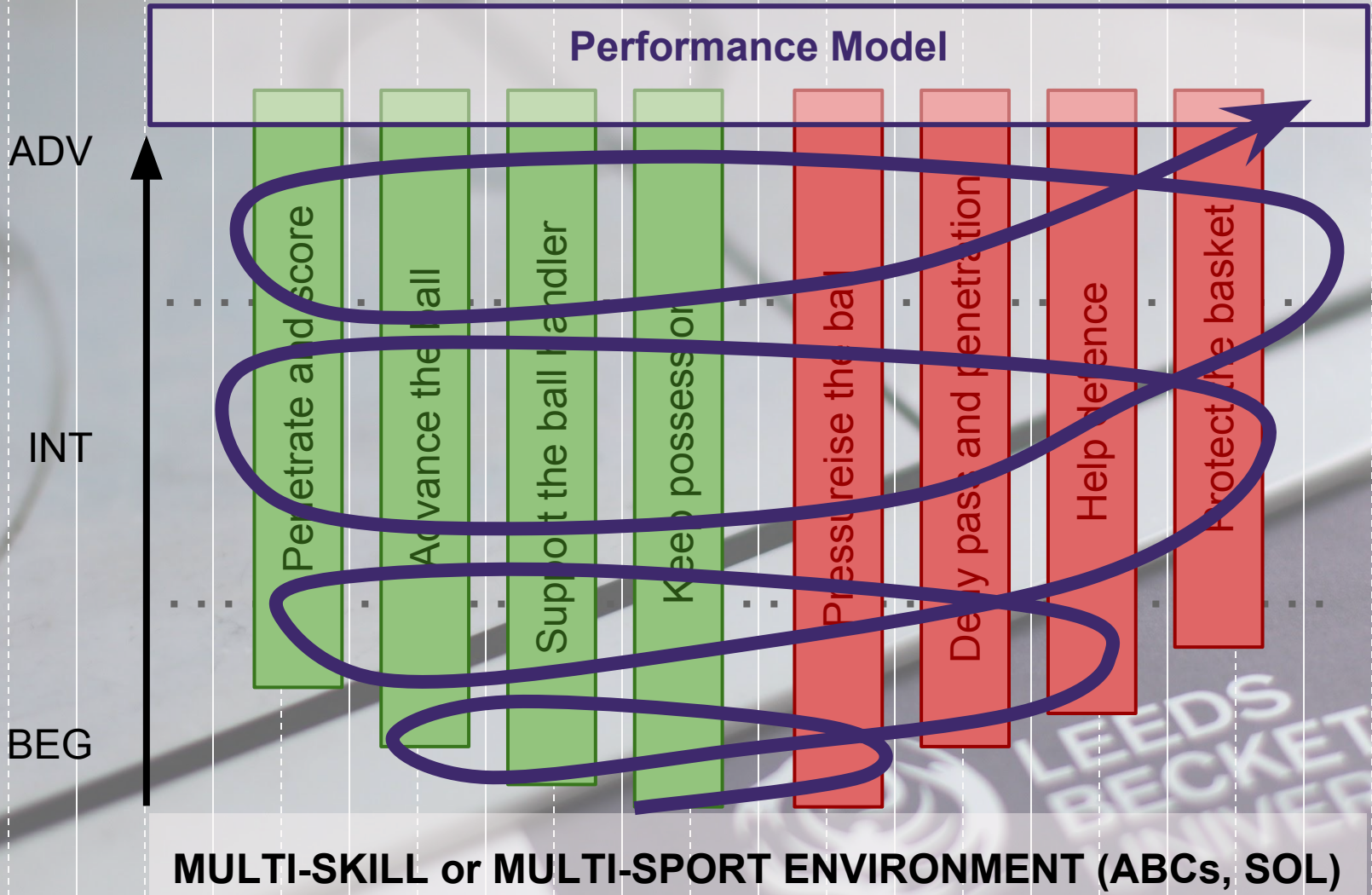


Neary (2002: p. 104)



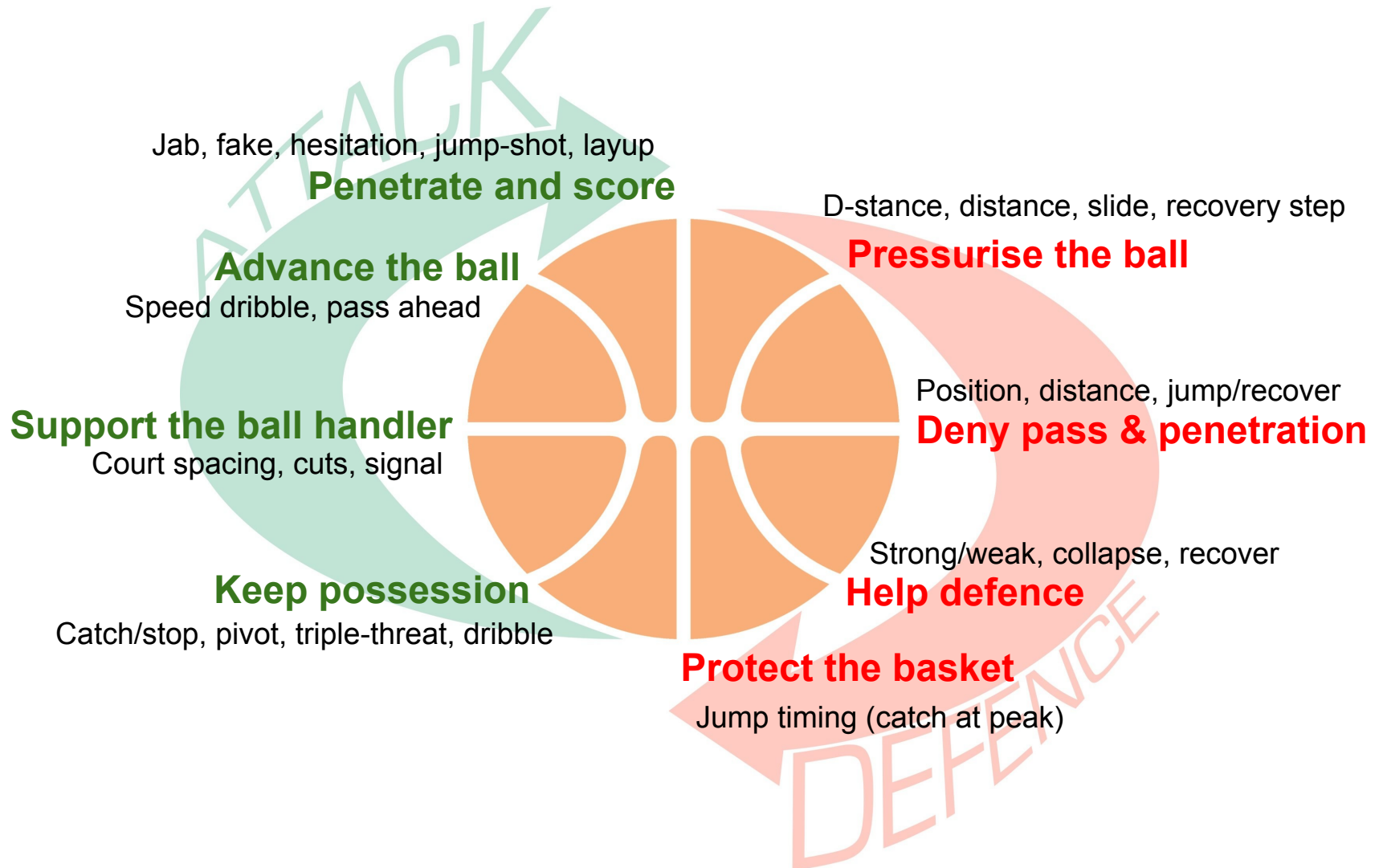
Harden & Stamper (1999)

Basketball curriculum example



'Horizontal slice' (technical) for U12s

(i.e. at the end of the stage, players should aspire to perform these techniques consistently in 3v3 game situations to solve problems)



Vertical slice ('pressurise the ball')

Stage	Tactical (understanding)	Technical (competence)	Physical	Psycho-social
ADV (+B&I)	Judging guarding distance based on individual opponent and team system; Selecting appropriate strategy against ball screens; Applying pressure in full-court	Fighting over ball screens; Switch aggressively; Darting under screens; Aggressive trapping	Upper-body strength; Lateral agility SAQ <i>Olympic lifts</i>	Perceptual decision-making skill (choosing strategy); Controlling aggression.
INT (+B)	Delaying the ball on the fast break; Judging appropriate physical contact (using upper-body to unbalance ball-handler)	Closing out under control; Forcing SLBL; Recovery step; Playing containment defence in the half court; Pressing to steal in full court.	Players can make a combination of short and long slides in reaction to a variable stimulus. <i>Relating to shutting down the first dribble in the HC.</i>	Persistence: keep going in face of adversity; Judging distance and levels of contact and aggression.
BEG	Adopting arms-length guarding distance; Keeping nose to chest and body between ball and basket.	Stance: <ul style="list-style-type: none"> • On the ball; • Away from ball (hand position and body shape). Movement: <ul style="list-style-type: none"> • Defensive slide, staying low and balanced; • Cut-off step; • Recovery step; • Drop step. Rebounding: <ul style="list-style-type: none"> • Catching ball at peak height. 		Focussing on relevant cues (location of ball and man); Determination to play without the ball; Communication (what to say and when e.g. "ball").

Summary

1. The ability to ‘simplify complexity’ (mental model) and develop a ‘vision’ (performance model) are core tasks for head coaches.
2. We have offered tools for helping coaches develop coherent TTMMs and performance models.
3. We argue that only with a TTMM and PM can a head coach create an effective developmental curriculum.
4. Bruner’s “spiral curriculum” concept, when paired with a TTMM (the structure) and PM (the goal), offers a method of organising long-term plans over multiple developmental stages.

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