Principles of effective curriculum design for sports coaches

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Outline

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

Understanding of Culture & Context:
Policies, Pathways, Resources, NGB, Player/Athlete/Participant/Other Expectations & Constraints

Understanding of Self: Personal Beliefs, Values & Behaviours

WHO are you coaching?
Using bio-psycho-social theories and concepts as thinking tools to understand your players needs and wants

What are you coaching?
Using technical, tactical and psycho-motor theories and concepts as thinking tools to build your sport specific performance model

How are we coaching?
Using skill acquisition theories and concepts as thinking tools to optimize learning and development opportunities

PLAN DO REVIEW

A Framework For Coach Decision Making (Adapted from Abraham, Muir & Morgan, 2010)
Preliminaries 2: best practice?
Preliminaries 3: importance

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

Qualities of Serial Winning Coaches

TABLE 6.2 Levels of Competence and Responsibility in Coaching

<table>
<thead>
<tr>
<th>Functions</th>
<th>Competences</th>
<th>Coaching Assistant</th>
<th>Coach</th>
<th>Advanced/Senior Coach</th>
<th>Master/Head Coach</th>
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</thead>
<tbody>
<tr>
<td>Set the vision and strategy</td>
<td>Understand big picture</td>
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<td></td>
<td>Align and govern</td>
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<td>Analyse needs</td>
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<tr>
<td></td>
<td>Set the vision</td>
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<td></td>
<td>Develop strategy</td>
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<td>Shape the environment</td>
<td>Create action plan</td>
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<td></td>
<td>Organise setting and personnel</td>
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<td></td>
<td>Identify and recruit athletes, staff and resources</td>
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<td>Safeguard participants</td>
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<td></td>
<td>Develop progress markers</td>
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<tr>
<td>Build relationships</td>
<td>Lead and influence</td>
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<td></td>
<td>Manage</td>
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</tr>
<tr>
<td></td>
<td>Manage relationships</td>
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<td></td>
<td>Be an educator</td>
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STEP 1

STEP 2

STEP 3

Seeing into the future
Constant reviewing
Simplifying complexity
Action planning

Vision
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’ (Grehaigne et al., 2005: p. 3)

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

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

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

Transition 1 (press or recover?)

Press
OR
Defend the Goal

DEFENCE

ATTACK

OR

Attack the goal
OR

Keep the ball

Transition 2 (break or build?)
Mental model example
Paired opposites of fundamental tactical problems in basketball

Rules (e.g. 24-second clock, backcourt) force a more penetrating/pressing approach
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)

<table>
<thead>
<tr>
<th>Basketball</th>
<th>THEME: Pressurise the ball</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tactical</td>
<td>Team aggressively and consistently force opponent away from strengths and intentions</td>
</tr>
</tbody>
</table>

| 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

Basketball curriculum example

Performance Model

ADV

INT

BEG

MULTI-SKILL or MULTI-SPORT ENVIRONMENT (ABCs, SOL)
‘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)

**Penetrate and score**
- Jab, fake, hesitation, jump-shot, layup

**Advance the ball**
- Speed dribble, pass ahead

**Support the ball handler**
- Court spacing, cuts, signal

**Keep possession**
- Catch/stop, pivot, triple-threat, dribble

**Pressurise the ball**
- D-stance, distance, slide, recovery step

**Deny pass & penetration**
- Position, distance, jump/recover
- Strong/weak, collapse, recover

**Help defence**
- Help defence

**Protect the basket**
- Jump timing (catch at peak)
### Vertical slice (‘pressurise the ball’)

<table>
<thead>
<tr>
<th>Stage</th>
<th>Tactical (understanding)</th>
<th>Technical (competence)</th>
<th>Physical</th>
<th>Psycho-social</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADV (+B&amp;I)</td>
<td>Judging guarding distance based on individual opponent and team system; Selecting appropriate strategy against ball screens; Applying pressure in full-court</td>
<td>Fighting over ball screens; Switch aggressively; Darting under screens; Aggressive trapping</td>
<td>Upper-body strength; Lateral agility SAQ Olympic lifts</td>
<td>Perceptual decision-making skill (choosing strategy); Controlling aggression.</td>
</tr>
<tr>
<td>INT (+B)</td>
<td>Delaying the ball on the fast break; Judging appropriate physical contact (using upper-body to unbalance ball-handler)</td>
<td>Closing out under control; Forcing SLBL; Recovery step; Playing containment defence in the half court; Pressing to steal in full court.</td>
<td>Players can make a combination of short and long slides in reaction to a variable stimulus. <em>Relating to shutting down the first dribble in the HC.</em></td>
<td>Persistence: keep going in face of adversity; Judging distance and levels of contact and aggression.</td>
</tr>
</tbody>
</table>
| BEG    | Adopting arms-length guarding distance; Keeping nose to chest and body between ball and basket. | Stance:  
  - On the ball;  
  - Away from ball (hand position and body shape).  
 Movement:  
  - Defensive slide, staying low and balanced;  
  - Cut-off step;  
  - Recovery step;  
  - Drop step.  
 Rebounding:  
  - 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.
References