Maximising Skill Acquisition for Softball

AIS Skill Acquisition

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Session Aims

1. Detail the non-negotiable principles of Skill Acquisition.

2. Discuss some of the research findings and the implications for coaching.

3. Provide a few brief activities to demonstrate some of the practical applications of Skill Acquisition.
Skill = Technique + Pressure
Non-Negotiable Principles
1) Practice Specificity

- “Transfer of practice to game conditions depends on the extent to which practice resembles the game” (Magill, 1993)
- How does this activity/drill relate to the game?
- Replicate as many of the game principles as possible eg. pressure, fatigue, motor skills
2) Practice Volume

- Deliberate Practice Theory (Ericsson et al., 1993)
  - 10 Years or 10,000 hours of practice required to attain expert levels
  - Goal-oriented
  - Well-defined and structured
  - Typically repetitious

- Past participation in other activities can reduce the amount of hours of deliberate practice needed to acquire expertise eg. basketball and invasion sports (Abernethy et al, 2002).

- Experts typically begin to specialise in their chosen sport between 13-15 years of age (Cote et al., 2003).
<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>PERFORMER</th>
<th>REPETITIONS</th>
<th>ESTIMATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cigar Making</td>
<td>Young women</td>
<td>3 mill cigars</td>
<td>Crossman 1959</td>
</tr>
<tr>
<td>Football Pass</td>
<td>Quarterback</td>
<td>1.4 mill</td>
<td>15yr x 200d x 4hr x 2/min</td>
</tr>
<tr>
<td>Football Punt</td>
<td>Player</td>
<td>.8 mill kicks</td>
<td>200/day x 5 days x 45wks x 15 yrs</td>
</tr>
<tr>
<td>Baseball Throw</td>
<td>Pitcher</td>
<td>1.6mill throws</td>
<td>3/min x 80mins x 300days x 10 yrs</td>
</tr>
<tr>
<td>Netball Shot</td>
<td>Goal Shooter</td>
<td>598,000 shots</td>
<td>200d x 5 days x 46 wks x 13 yrs</td>
</tr>
</tbody>
</table>

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3) Practice Variability

- Generally it is considered advantageous to vary practice conditions to maximise retention and transfer of skill

- A key mediating issue is how the variable practice conditions are organized during a session
  - Infield throws to 1st base
  - Fly-ball catching drill
  - Ground ball fielding drill
  - Batting drill

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## Applications

<table>
<thead>
<tr>
<th>ATHLETE</th>
<th>SKILL</th>
<th>PRACTICE</th>
<th>INTERFERENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginner</td>
<td>Open</td>
<td>Blocked</td>
<td>Low</td>
</tr>
<tr>
<td>Intermediate</td>
<td>Open</td>
<td>Block/Random</td>
<td>Low/High</td>
</tr>
<tr>
<td>Elite</td>
<td>Open</td>
<td>Random</td>
<td>High</td>
</tr>
</tbody>
</table>

(Schmidt, 1991) © Australian Sports Commission
Applications

- Performance or learning
- Skill Circuits
- Feedback / Cognitive Intervention
- Matchplay / Strategy Practice
- Anything that causes players to revisit the skill
4) Learning Styles

- Perceptual Preference (Learning Style)
  - The sense through which athletes remember information most easily (hearing, seeing, or feeling/doing)
  - If coaches can cater for an athlete's individual preference, it individualises instruction & enhances achievement
  - Matched feedback for learning style

Learning styles questionnaire

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Video-Based Training

Some examples from other sports
Video-Based Training

Advantages
• Low impact
• Coach doesn’t have to be present
• Portable (travel)
• Injured players
• Good fun (computer game)

Considerations
• Player perspective or broadcast footage?
• Life-size or computer screen?
• What instructions should be provided? (implicit/explicit)
• Complexity of image?

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Batting Concepts
Batting Research

• Physically impossible to watch the ball all the way to contact with the bat.

Skilled batters:
• Watch the ball for longer than lesser skilled.
• Have a more stable head position.
• Track the ball to a certain point and then jump to a point where they think it will contact the bat.
• Use information from the pre-release action of a pitcher.
• Watch the anticipated release zone (grip, wrist action, etc.)
• Also consider field settings, previous history of pitcher, state of game, etc.

(Magill, 2004)
Sports Vision Training

• Visual acuity, peripheral vision and depth perception.
• Expert-novice differences typically don’t exist on generalised tests of visual function.
• Lack of a direct relationship between general visual skills and sports performance.
• Visual training programs using non-sport specific repetitive eye exercises don’t work.

(Abernethy & Wood, 2001)
Coaching Implications

- Increase speed of bat swing to almost as fast as possible (but not so fast that the movement becomes uncoordinated).
- Still useful to say “watch the ball onto the bat” to encourage visual tracking of ball flight.
- Keep head stable (weighted hats?)
- Keep the swing consistent in terms of speed and backswing position.
- Adjust initiation of movement to get accurate timing.
- Watch release point of pitch and develop anticipation.
- Overload training of perceptual capacities:
  - Coloured ball drills (traffic lights), video training, eyes closed, dish-glove

(Schmidt, 1991; Magill, 2004)
Lessons from Cricket

When facing a bowling machine:

• Batter moved front foot into position earlier.
• Greater variation in initiation of backswing.
• Could anticipate delivery easier.

Problems:

- Stroke selection made too early.
- Timing errors.

Suggestions:

- Use machine for teaching technique.
- Use real bowlers for teaching timing. (Gibson & Adams, 1989)

Are drills such as “soft-toss” worth doing?
Pitching Concepts
Skilled Pitchers

- Produce movements which are both smooth & highly efficient (minimal unnecessary ill-timed force production)
- Use consistent movements
- Superior force control
What batting research tells pitchers

• Disguise critical cues

• Present false cues

• Increase the number of possibly relevant cues

• Vary all possible dimensions of object flight

• Present critical cues as late as possible

(Glencross & Cibich, 1977)
Pitching Practice Strategies

- Ensure your pitching posture is consistently correct
- Develop ability to analyse your pitch based on ball flight
- Develop feel for your technique
- Use of targets
  - Some individuals predisposed to focus on movement mechanics = paralysis by analysis
  - Direct attention toward external effects of action, rather than limbs eg. look at the target (Johnny Wilkinson)
Catching
Catching – Key Viewing Periods

Hit

Estimates of direction and distance

Catch

Time-to-contact information for final positioning of hands/fingers and timing grasp

(Magill, 2004)
Catching a Fly-Ball

- Foot movements first sign of response initiation.
- Non-expert catchers initiated foot movements earlier than experts but not always in correct direction.
- Experts waited until they had the key ball-flight information before moving in the correct direction.

(Oudejans et al., 1997)
Catching – Practice Considerations

- Learners need vision of their hands.
- Dual-task activities.
- Use coloured/striped balls to promote visual tracking.

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Suggested Reading


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