

CHAPTER 8 – LEARNING AND PERFORMANCE

Text between pages 100 and 111, answers to questions on pages 110 and 111 of the text book.

1) Figure 8.24 shows the improvement in performance of a gymnast over a period of time.

a) Name the stages **A**, **B** and **C** shown on this chart and explain their significance to the gymnast. 6 marks

Answer

- **A - Cognitive stage.**
- For example, a beginner watching a demonstration.
- He or she is able to perform simple routines without much technical complexity.

- **B - Associative stage.**
- For example, the gymnast has learnt a number of simple routines which he or she can now put together into a more complex sequence.
- Trial and error and complex advice from the coach now lead to more rapid progress.

- **C - Autonomous stage.**
- For example, the gymnast is able to perform complex skills without much cognitive effort.
- His or her routines are now technically excellent and can be performed without the constant intervention of a coach.
- The coach's role is now to choreograph and advise on the shapes and sequences of movement rather than the techniques involved.

b) Identify the characteristics of a performer in phase **C**. 4 marks

Answer

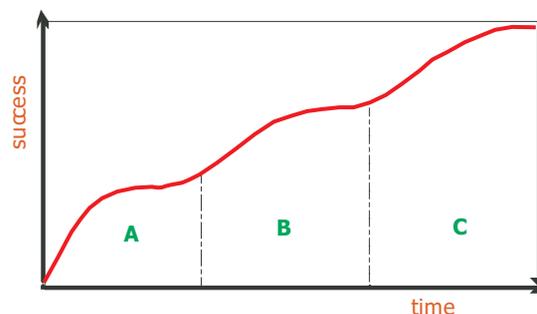
- Almost automatic in movements.
- Seems confident or has predetermined goals.
- More likely to complete complex movements.
- Is successful consistently.
- Less likely to lose concentration and so is focused.
- Advanced performers will only stay in this phase if they keep referring back to the associative phase or keep practising.

c) How might the type of mental practice change in the last phase of learning? 4 marks

Answer

- Concentrating on only very few stimuli or very selective in attention.
- Less about skill performance, more on keeping calm and controlling arousal.
- Utilising imagery of the sequences as part of the warm-up.
- Visualising success more than other phases.
- Thinking more about tactics or strategies.

figure 8.24 – performance of a gymnast



- 2) According to Fitts and Posner, learning passes through three stages. Use an example from one of your practical activities to describe the key characteristics of each of these stages. 5 marks

Answer

Select your practical activity.

Stage 1: cognitive

- Learner is using trial and error learning.
- Getting an idea of the skill.
- Many mistakes made.
- Movement is inconsistent.
- Movement lacks fluency
- Performer concentrates on every aspect of the movement.

Stage 2: associative

- Movement is smoother.
- Subroutines linked.
- Performer can use kinaesthetic feedback.
- Motor programmes are formed.
- Practice required and awareness of mistakes.

Stage 3: autonomous

- Movements are automatic.
- No conscious thought or attention required.
- Tactics and strategies can be focused on.
- Reaction time is reduced.
- Detailed external feedback can be used.
- Errors can be detected and corrected without help.
- Must practise to remain in this stage.
- Fluent, flowing.

- 3) a) Describe what is meant by the term feedback, and briefly describe **three** functions of feedback. 5 marks

Answer

- **Feedback** is any kind of information received by a learner as a result of a particular response or act.
- This information would be available during and after the movement had been completed.
- And would be brought into the system both during the course of the movement and after the movement had been completed.

Functions of feedback are:

- **Motivational:** success or failure, clear goals, inspires the performer to continue striving for perfection.
- **Reinforcing:** increases the chance of the performer repeating the performance.
- **Informational:** the outcome of the performance, is it correct or incorrect?

- b) Where possible explain the kinds of feedback available to a performer which would be classified as:

- i) Intrinsic and internal.
- ii) Extrinsic and internal.

4 marks

Answer

- **Intrinsic and internal** feedback represents feedback that is perceived by the performer.
- By proprioception, the feeling of muscle tension.
- And the performer is able to relate this to feelings of success or failure.
- **Extrinsic and internal** feedback represents feedback that might be due to a crowd noise reacting to a game situation.
- Which leads to a feeling of well being or success.
- Or seeing other performers' reactions to your performance which leads to the same feelings.

- 4) Explain how feedback differs through the associative and autonomous stages of learning as a performer makes progress. 4 marks

Answer

- In the **associative** stage, the performer begins to monitor his or her own feedback.
- He or she still needs feedback from the coach which is more technically exact than for the novice (cognitive phase) performer.
- Feedback will be more extrinsic than intrinsic.
- In the **autonomous** stage, the performer would be less reliant on knowledge of results.
- He or she would be able to detect his or her own errors and use kinaesthetic feedback to do this.
- He or she would be able to correct his or her own performance without coach intervention.

- 5) A pole vaulter makes rapid progress when first learning the event, but then reaches a plateau of performance.

- a) Explain what the plateau is and why it might occur. 4 marks

Answer**A plateau:**

- A plateau is when the performance stops improving and performance levels out.

The plateau occurs because:

- The person has **limited ability** and has reached the limits of possible performance.
- The training tasks are **too difficult** for the performer.
- The person has reached the **limits** of the cognitive stage of learning, and is ready to move to the associative stage – with different ways of learning and guidance.
- There is a **transitional period** before development of a more complex skill.
- The person is injured or **overtrained**.
- The person becomes **bored** with the skill learning process.
- The person is **fatigued**.
- Coaching has reached the **limit of the coach's ability**.
- Once a certain level of performance is reached, the person is **less well-motivated** to learn or train.
- Once a certain level has been reached, the skill or power level required to improve further requires **much more time and intensity of focus**.

- b) What strategies could be used to improve from the plateau level? 4 marks

Answer

- Give new **goals** that can be reached.
- Give **praise** that is deserved.
- Give new **responsibility** (team captain?).
- Ensure that there are regular **rest** intervals.
- Maintain **motivation** and employ positive cognitive techniques.
- **Explain** what the plateau is, and why progress will be made in the future.
- Provide appropriate **feedback**.
- **Vary** types and methods in training.
- Re-establish physical **fitness**.
- Look at **technical development** for possible variations or improvements.
- Improve **coaching** knowledge.
- Change the way in which a **skill is taught**, with whole-part-whole practice.

6) a) What sort of motivation methods would you use to motivate a beginner in gymnastics?

4 marks

Answer

- Give **achievable goals** and success.
- **Reinforce** through praise or success.
- Only praise when it is deserved.
- Verbal encouragement.
- Vicarious processes or give models of similar ability.
- Introduce a small element of competition.
- But keep competition to a minimum.
- Emphasise personal progress.
- Raise status of the activity.

b) How would the motivation methods used for a skilled performer differ from those used for a beginner? 3 marks

Answer

- Give more demanding goals or goals which are just beyond reach.
- Emphasise results.
- Comparisons play a bigger part.
- Larger extrinsic rewards.
- Use of audience or the presence of others.
- Reinforce success.
- Reinforce tactical aspects.
- Attribute success to internal factors.

7) a) Explain how you would use operant conditioning to teach a sports skill of your choice.

5 marks

Answer

- **Operant conditioning** is shaping behaviour by reinforcement.
- The sportsperson has a go at the sport, and the correct effort is reinforced, and the incorrect effort is negatively reinforced.
- This is done by the teacher praising success, and hence giving the sportsperson a feeling of well-being when success is achieved.
- When an incorrect effort is achieved, praise is withdrawn or not given.
- So the sportsperson learns to **associate** (connect) praise (and well-being – the **stimulus**) with a correct effort (the **response**).
- This is called the **stimulus-response** bond.
- The sportsperson is learning by trial and error.
- Eventually, incorrect responses will disappear, because the person wants to feel good.
- This process can be extended by showing the sportsperson how to perform the activity, this is called shaping, then the **correct shape** is reinforced (rather than just the shuttle going over the net as in badminton).
- For example, to teach a high long serve in badminton.
- Give demonstration (shaping).
- Get opponent to stand in service box opposite with racket held high (shaping).
- Give targets to aim for (shaping) – aim to get the shuttle over the opponent's head.
- Give **knowledge of results** (reinforcement) – did the shuttle pass over the opponent's head and land inside the baseline?
- Give **feedback** about performance (reinforcement) – was the shot performed with the correct wrist movement?
- Give **praise** (reinforcement).

b) Describe what is meant by reinforcement and give examples of different types.

4 marks

Answer

- Reinforcement is the manipulation of a stimulus to ensure that a response recurs.
- For example, **positive reinforcement** - giving praise when a swimmer wins a race.
- For example, **negative reinforcement** - taking away the praise if the swimmer subsequently loses.
- For example, **punishment** - telling the swimmer off for not trying very hard if he or she loses the race.

8) a) Using examples from sport explain what is meant by the S-R bond. 4 marks

Answer

- A certain response is connected to a certain stimulus. For example, a forehand is hit by a right-handed player because the ball appears on the right hand side of the player's body.
- The stimulus acts as a cue to be associated with a response. For example, in volleyball a player will jump to block a ball being smashed across the net by the opposition.
- The response is almost automatic because the bond is so great between stimulus and response.
- For example, a 'reflex' save by a goalkeeper to a shot on goal.
- Or a sprinter driving out of the blocks when the gun goes.
- The bond (link) is strengthened by reinforcing correct responses – giving praise for correct responses, and withdrawing praise or giving punishment for incorrect responses.

b) Explain how a coach in a sport could ensure that a correct response follows a particular stimulus. 5 marks

Answer

- Give **praise** or positive reinforcement.
- Give **feedback** or give direct knowledge about what to do.
- Give **satisfaction** if movement is correct (Thorndike's Law of Effect).
- Give **negative reinforcement** (withdraw praise) if movement is incorrect.
- Give **punishment** if movement is incorrect.
- **Repeat** the correct movement to establish a motor programme.

9) a) In racquet sports, coaches give demonstrations to aid skill development. Identify the stages of Bandura's model of observational learning, giving an appropriate example of each stage to illustrate your understanding. 4 marks

Answer

- **Attention** - key areas of the skill are highlighted.
- **Retention** - the performer must remember information in order to reproduce it.
- **Motor reproduction** - the performer must be physically capable of reproducing the skill.
- **Motivation** - the performer must be motivated to perform the skill, by intrinsic or extrinsic means.

b) Explain the cognitive theory of learning as proposed by Gestaltists and apply this to a practical situation. 4 marks

Answer

- Gestalt means '**whole**' - the learner must look at the problem associated with learning a skill in its entirety.
- Concerned with understanding and insight.
- A racquet player will understand the necessity for performing a particular shot.
- In respect of the tactics of the game, and the exploitation of an opponent's weakness.

- 10) Stimulus-response bonding has been used to explain how a physical skill can be learned. What is a stimulus-response bond and how can a Physical Education teacher ensure that it is strengthened when teaching swimming or athletics? 6 marks

Answer

Definition of S-R bond:

- Performer learns to link a particular response to a particular stimulus.
- For example, the starter's gun in swimming (stimulus) triggers the swimmer's movement (response) from the blocks or poolside.

Strengthening the S-R bond:

- Must use swimming or athletics example.
- Use reinforcement, praise or punishment to ensure that the person is made to feel good about the correct response, and bad about an incorrect response.
- **Thorndike's Law of Readiness:**
- A performer must be mentally and physically able to do the task.
- For example, a learner swimmer must want to and be physically capable of trying butterfly if she is to master the stroke.
- For example, an 11 year old boy will be physically incapable of performing a slam dunk in basketball.
- **Thorndike's Law of Exercise:**
- Practice of the task will strengthen the S-R connections.
- For example, the athlete has frequent attempts at the sprint start.
- **Thorndike's Law of Effect:**
- If the response is followed by satisfaction or positive feedback (a 'satisfier'), the bond is strengthened.
- If the response is followed by an intense emotional feeling (of well-being) the bond is strengthened.
- For example, the swimmer who feels pride after doing 25m for the first time.
- If the response is followed by an 'annoyer' or negative feedback, the bond is weakened.
- For example, a young high jumper who repeatedly knocks the bar off because the bar is too high.
- **Positive reinforcement, Reward or Praise:**
- Operant conditioning or shaping increases the chance of the behaviour occurring again.
- For example, the swimmer gains a badge for completing 25m.
- **Negative reinforcement:**
- The behaviour is likely to be repeated when a stimulus is withdrawn.
- For example, no-one makes fun of the pupil who usually comes last when he or she achieves a better placing.
- **Punishment:**
- The stimulus given prevents a particular response occurring.
- For example, a pupil is made to perform an extra lap of the track for unsafe behaviour in the javelin lesson.

- 11) a) Using examples from sport, identify **four** items of information stored as schema. 4 marks

Answer

- **Knowledge of the environment**, for example, knowing how far away you are from the basket before you shoot in basketball.
- **Response specifications**, for example, knowing what you have to do to score.
- **Sensory consequences**, for example, what the movement feels like as you are shooting.
- **Response outcomes**, for example, the end result which would be either success or failure.

- b) Comparing the skills of throwing the javelin and taking a free throw at basketball, explain how the skills are related using schema theory. 4 marks

Answer

- **Knowledge of initial conditions** (of the environment) - awareness of the foul line and the need to complete the throw behind it (javelin), awareness of side line again with the need to complete the throw outside the court proper (basketball).
- **Knowledge of response specifications** - knowing that you have to throw as far as possible into the field (javelin), knowing that you have to throw to a colleague on the court (basketball).
- **Knowledge of sensory consequences** - the feeling of the movement of throwing (both).
- **Knowledge of response outcomes** - distance thrown (javelin), correct receipt of the ball by colleague (basketball).

- 12) How could a teacher of Physical Education use his or her knowledge of schema theory when planning a practice session for a named activity? 5 marks

Answer

- **Information in LTM** used to modify:
 - Motor programmes.
 - A set of rules that determine the performance of a skill.
 - A scheme that provides the basis for a decision.
 - For example, teacher tells group that they are going to learn reverse stick dribble in hockey by using the information already stored.
- **Variability of practice:**
 - Building up a set of 'rules' through different variations.
 - Practice takes into account all the possibilities.
 - For example, practising throwing different lengths, speeds, directions and angles.
- **Errors** can be included in practice to develop the schema.
 - For example, the defender can only learn to block an opponent by having a go.
- **Recall schema** starts:
 - The movement.
 - Initial conditions.
 - Body position.
 - Details concerning the environment contained in recall schema.
 - For example, the distance between players for specific passes in an invasion game.
- **Response specifications:**
 - What is required to do the skill.
 - For example, the players need to know how fast to move to get free.
- **Recognition schema:**
 - Controls the movement.
 - Information required to evaluate the movement.
 - For example, sportspeople need to know what to do to improve.
- **Sensory consequences:**
 - Information based on kinaesthetic or proprioceptive feedback.
 - Information using all the sensory systems.
 - For example, remind the players of how the skill felt last time.
- **Response outcomes:**
 - Use of knowledge of results.
 - Comparison between actual and intended outcome.
 - Refer to past experiences.
 - For example, was the shot at goal successful?

- 13) Explain **four** different types of transfer of learning. 4 marks

Answer

Any four from:

- **Positive transfer** is one skill helping the learning or performance of another.
- **Negative transfer** is one skill hindering the learning or performance of another skill.
- **Bi-lateral transfer** is the transfer of learning or performance from limb to limb.
- **Retroactive transfer** is the influence of a skill being learned on a previously learned skill.
- **Proactive transfer** is the influence of a skill being learned on future skills, a skill learned in the past has an influence on a present skill.

- 14) a) Using a practical example, explain what is meant by the term 'transfer' in skill learning.
How can transfer be detrimental to performance? Give a practical example.

5 marks

Answer

Transfer in skill learning:

- The influence of the learning or performance of one skill on the learning or performance of another skill.
- If you perform one skill and then perform another, the second may well be affected by the first.
- For example, you perform a push pass in hockey and then you perform a flick, the actions of the first skill may help that of the second (positive transfer).

Detrimental to performance:

- The performance of one skill may well hinder the performance of another.
- Because there may well be inappropriate movements or information processing which could confuse the performer.
- For example, a badminton player may play tennis immediately after playing badminton and the forehand in tennis may be far too 'wristy' because of the confusion in the response.

- b) How can a teacher or a coach ensure that as much positive transfer takes place as possible in a training session?

5 marks

Answer

- The coach uses as many **different practices** as possible in training – drills are varied.
- Emphasise the **transferable elements** of the skills.
- Tell performers about transfer to heighten awareness.
- To ensure the building of schema.
- Make sure training is relevant to the 'real' game.
- Environmental conditions need to be similar.
- Tactics, strategies and information processing elements need to be similar.
- **Avoid confusing practices** to avoid negative transfer.
- Ensure that skills are **thoroughly learned** before moving on to other skills.
- Give **distributed practice sessions** in which there are rest intervals for mental assimilation.
- Positive previous experiences or values assist transfer.

- 15) A coach reinforces good performances in training with praise. Why does this reinforcement work rather than punishing poor performance? Explain what is meant by reinforcement and punishment in this case.

5 marks

Answer

- **Reinforcement** works because the **praise** (giving a pleasant experience) to the performer will enhance and give **motivation** to the performer to repeat the good performance.
- The S-R bond is enhanced.
- **Punishment** of a poor performance (giving an unpleasant experience) has the chance that the person could be **demotivated** by the activity.
- And good performances never attained.

What is meant by reinforcement?

- Reinforcement is the giving of pleasant experiences for good performances to attempt to enhance the S-R bond and stimulate the correct response.

What is meant by punishment?

- Punishment is the giving of unpleasant experiences for poor responses or performances.
- This is an attempt to make a performer reject an undesirable response.
- And hence try harder to attain a correct response.

16) a) Explain the difference between massed and distributed practice. 2 marks

Answer

- *Massed* - no rest intervals with practice conditions of long duration.
- *Distributed* - rest intervals at regular periods of time during a session.

b) Justify the choice of practice conditions for a training session of a sport of your choice. 6 marks

Answer

Massed:

- To ensure motor programmes are learned (overlearning).
- To encourage an habitual response.
- To cut down on response or reaction time.
- Good for learning discrete skills.
- Good for skills performed over a short duration, for example, basketball shots.
- But can lead to fatigue, boredom or demotivation.

Distributed:

- To give physical rest or recuperation.
- To give mental rest or time to gather thoughts.
- To relieve stress.
- Provides safety for dangerous activities.

c) Name **two** characteristics of the task, and **two** attributes of the learner which might lead you to decide which method (massed or distributed) of practice to use. 4 marks

Answer

Two characteristics of a task from the following:

- Whether the skill was complex and lengthy or short and discrete.
- Whether the task required great fitness levels.
- Whether the task was dangerous or not.

Two attributes of the learner:

- The motivation levels of the learner.
- The personality of the learner (whether or not he or she would be prepared to persist in the learning task).

17) a) What are the main positive effects of setting goals in sport? 2 marks

Answer

- Raising motivation levels.
- Controlling anxiety or stress.

b) Show what is meant by short-term goals and long-term goals by using examples from sport. 4 marks

Answer

- *Short-term goals* - process oriented goals.
- Which affect aspects of performance.
- For example, the goal of following through into court after a serve in tennis.
- *Long-term goals* - product oriented.
- Which affect the result or future aim.
- For example, to beat your personal best in athletics or to win the league at soccer.

17) c) As a coach how would you ensure that your goal setting was as effective as possible?

6 marks

Answer

- Goals must be *attainable* or within your reach.
- Goals which are *challenging* are more motivating.
- Set goals which are *positive* rather than negative.
- Goals should involve *individual* as well as team targets.
- Goals should be *measurable*.
- *Target dates* are important so that the performer is accountable.
- Goals should be *negotiable*.
- Goals should have *shared ownership*.
- Goals should be a mixture of process and product.