

## CHAPTER 6: Principles and theories of learning, guidance & feedback

### Practice questions - text book pages 86 - 88

- 1) The critical activity in the associative stage of learning is to:
- develop an understanding of the task.
  - refine the motor skill and associate specific environmental cues with specific movements to develop a basic movement pattern.
  - make small adjustments to the skill to improve performance.
  - learn by copying others.

**Answer:** a.

**Explanation:**

- *In the associative stage of learning the learner has an overall picture of what is required since learning occurs as a result of the association or connection between a stimulus and a response, and so the correct answer is a.*

- 2) Performance changes tend to be largest in which stage of learning?
- cognitive.
  - associative.
  - autonomous.
  - a. and c.

**Answer:** b.

**Explanation:**

- *During the associative stage there is a lot of fault correction and so skill mastery will be at its greatest.*
- *Whereas during the cognitive stage the learner has little idea of what is a correct performance and so learning will be limited.*
- *At the autonomous stage the learner knows how to complete the skill and can do so with a great degree of competence.*
- *Choice d. is a complete red herring.*

- 3) Within Fitts and Posner's cognitive phase of learning the key aim is to:
- organise a more efficient movement pattern.
  - make the actions automatic.
  - understand the skill.
  - focus on the established movement patterns.

**Answer:** c.

**Explanation:**

- *The cognitive phase of learning is the initial learning of basic skill development and so understanding the skill using role models, guidance and feedback is the key aim of this phase of learning.*

- 4) What term did Bandura use to refer to the overall process of social learning?
- vicarious reinforcement .
  - modelling.
  - conditioning.
  - self-efficacy.

**Answer:** b.

**Explanation:**

- *Bandura's social learning theory describes learning by copying others and so having good role models enables the learners to imitate what is seen.*

- 5) Which is the best type of guidance a coach could use when coaching an advanced skilled performer?
- visual.
  - mechanical.
  - verbal.
  - manual.

**Answer:** c.

**Explanation:**

- *Since the performer knows how to complete the required skill and the coach is able to use often complicated verbal guidance effectively to refine performance.*

- 6) Visual guidance is a very important tool when learning a new motor skill. Which one of the following possible answers should be considered prior to using visual guidance?
- visual guidance can overload beginners with too much information.
  - visual guidance should be used in conjunction with verbal guidance.
  - visual guidance should be used during the autonomous stage of learning.
  - visual guidance should be used during the cognitive stage of learning.

**Answer:** d.

**Explanation:**

- The answer is d. since visual guidance helps create a mental picture of the new motor skill.

- 7) What is the best description for how visual feedback could be used during the later stages of learning?
- to enable the performer to attend to more detailed and lengthy bouts of verbal feedback.
  - to gradually phase out extrinsic feedback in order to reduce the effects of feedback dependency.
  - to provide concurrent feedback during the movement.
  - give the performer time after feedback before practicing the skill again.

**Answer:** a.

**Explanation:**

- During the later stages of learning, visual feedback should be used to highlight specific elements of the skill which need attention and so the correct answer is a.

- 8) 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.

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

4 marks

**Answer:**

4 marks from 4 of:

- Feedback involves using information that is available to the performer during and after the execution of a skill.
- During the **associative stage of learning**, the learner has an overall picture of what is required of the skill, but still makes mistakes.
- **Intrinsic feedback** involves the learner associating the 'feel' of the activity, via kinaesthesia, with the end result.
- And combined with **extrinsic feedback** through visual and auditory systems (from an external sources such a coach), by providing knowledge of performance and results, play a significant role as the performer makes progress.
- During the **autonomous phase of learning**, movements are well integrated as athlete is able to **perform without conscious effort**.
- The skilled athlete provides their own intrinsic feedback as he or she is able to judge and assess performances and make corrections by him or herself.
- The coach works in partnership with the athlete in the refining of technique.

- 10) 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.

11) 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.

- 12) 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 eleven year old boy will be physically incapable of performing a four-turn hammer throw.

- **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.

13) a) What do you understand by the term insight learning?

1 mark

**Answer:**

- Insight learning is concerned with the **thinking** and **understanding** or **cognition** which recognises relationships that can be used to solve new problems - known as the **Gestaltist** theory.

b) Discuss how the theory of insight learning could be used in the learning of sports skills.

4 marks

**Answer:**

- Learning can be accelerated by using '**insight**' to solve a problem.
- For example, a gymnast wants to link two moves in a floor sequence, but are not sure how to do it.
- The gymnast tries several ideas (called variables) which help **clarify**, resolve and produce a movement solution.
- Learning is most effective when the problem is seen as a **whole**.
- Or when the **whole pattern** of the movement can be **practised**.
- This enables the learner to understand **all the issues** and relationships that need to be considered.
- The Gestaltists therefore advocate that learners **practice** a skill as a whole, for example a tennis serve.

14) a) Using a practical sporting example, explain how operant conditioning can shape behaviour?

4 marks

**Answer:**

- Operant conditioning is concerned with actions being **shaped** and then **reinforced**.
- Conditioning of this type will only take place only if **reinforcement** is present.
- For example, a rugby player kicks the ball, when it should have been a pass.
- By rewarding (**reinforcing with praise**) every time the player passes, gradually the player learns to pass the ball, resulting in **behaviour modification**.
- As a result of the **correct S-R bond being strengthened** and the incorrect S-R bond being weakened.

b) According to Bandura, what are the main characteristics of his social theory model that influences the likelihood of imitation of a demonstration taking place?

4 marks

**Answer:**

- Demonstration of the skill using a **model** performance.
- That learners can **attend** to instructions or provide **cues** about how best to perform.
- **Retention** then occurs as learners **remember** the demonstration.
- Followed by **motor reproduction** as the learners attempt to copy the movement.
- And are **motivated** to do so.
- And finally learners **match** the performance.

15) **A Level.** Discuss the impact theories of learning can have on skill development.

15 marks

**Answer:**

Note that you are expected to write about one learning theory for each of the following categories:

- **cognitive** or insight theory,
- **associationalist** theory,
- **social learning** theory.

5 marks for each category,

There are many theories associated with the art of **learning skills**.

- **Cognitive** or insight theories are concerned with understanding and **insight** and are the work of **Gestaltists**.
  - With this idea, learning is based on the **intellectual ability** of the individual.
  - The person needs to see the **whole problem** and produce an appropriate solution.
  - For example, a gymnast wants to link two moves in a floor sequence, but are not sure how to do it.
  - The gymnast tries several ideas (called **variables**) which help clarify, resolve and **produce a movement solution**.
- There are several **associationalist** theories that state that learning occurs as a result of the association or connection between a stimulus and a response called the **S-R bond**:
  - Operant conditioning theory (**Skinner**) occurs when a performer **chooses** the **correct** response from a range of actions and is then **rewarded** by the coach.
  - Therefore the performer's action is **shaped** by the coach.
  - For example, the coach gives a tennis player a particular target to aim for during a tennis serve.
  - Then reduces the target area to one corner of the service box.
  - The coach reinforces (through **knowledge of results**) the good serves after the player has performed the skill, thus **strengthening** the S-R bond.
  - The performer need not understand why he or she is performing in this way, but only that he or she will be **rewarded**.
- **Social learning** theory describes learning by copying the behaviour of others or observational learning.
  - For learning to take place the **model** must have high status or competency.
  - And the task must be **relevant** to the performer's needs.
  - Modelling is more likely if the model is the same **age** or **gender** as the observer.
  - According to **Bandura** social learning learning takes place because the observer is able to **correct sensory images** and arrange them in time order sequence so that they make sense:
    - **Demonstration** of the skill using a **model** performance.
    - That learners can **attend** to instructions or provide **cues** about how best to perform.
    - **Retention** then occurs as learners **remember** the demonstration.
    - Followed by **motor reproduction** as the learners attempt to **copy** the movement.
    - And are **motivated** to do so.
    - And finally learners **match** the performance.
- Another **social learning** theory is based on social development or constructivism as proposed by **Vygotsky**.
  - This theory considers the role of **social interaction** in the development of cognition and is underpinned by three main concepts:
    - '**Tools of intellectual adaptation**' which can be achieved with **guidance** from a teacher or coach.
    - '**Zone of proximal development**' refers to a teacher/coach **assisting** a learner to develop more complex skills.
    - '**Reciprocal teaching**' occurs when a teacher/coach **collaborates** in learning the key skills by questioning and clarifying the aspects of performance.
- Over time, the teacher/coach input reduces and the performer becomes more **independent**.

16) a) Why is visual guidance particularly suitable for learning a new skill? 2 marks

**Answer:**

- Provides learner with a **mental image** of the skill.
- In terms of sequencing or timing of the movement.
- Draws attention to key points such as cues.

b) Why can verbal guidance be of limited use on its own? 2 marks

**Answer:**

2 marks for 2 of:

- Can **overload** beginners with information.
- Learner may **lose concentration**.
- **Language** may be **too complex** for beginners.
- Not as useful when used by itself.
- Therefore should be combined with other forms of guidance.

c) What are the benefits of verbal guidance? 3 marks

**Answer:**

3 marks for 3 of:

- Tactics can be explained.
- Gives **technical information**, key points and highlights cues.
- When used with visual can form mental image.
- More effective for the autonomous stage of learning.

d) When are manual and mechanical guidance best used? 4 marks

**Answer:**

4 marks for 4 of:

- **Manual guidance** uses physical support and is best used with competent performers during the **autonomous** stage of learning.
- As it gives kinaesthetic awareness and confidence to the learner.
- **Mechanical guidance** involves the use of equipment to help support the learner and shape the skill.
- And is best used during the **cognitive** stage of learning.
- As it helps the performer learn a movement whilst building confidence and getting a sense of how it should feel.

17) a) Other than visual guidance, what other main methods of guidance are there? Give a practical example for each. 6 marks

**Answer:**

- **Verbal** - for example, instructions to an athlete before a race.
- **Manual** - for example, supporting a gymnast doing a handspring.
- **Mechanical** - for example, a child using stabilisers on a bicycle.

b) How would you optimise the use of visual guidance in teaching motor skills? What are the drawbacks of this method? 4 marks

**Answer:**

**Visual guidance:**

2 marks for 2 of:

- The coach or teacher would use an **accurate demonstration**.
- **Cueing** the performer to important elements.
- Use immediately before performance.
- If visual guidance is used as feedback, it must be used immediately after the performance.
- Make sure it is supplemented with verbal guidance.
- If models or videos are used, ensure relevance to the learner.
- Make sure the model presented is attainable.

**Drawbacks:**

2 marks for 2 of:

- Confusion if too much visual guidance is shown at a time.
- Model or demonstration may be inaccurate.
- If videos are used, these may be boring or demotivating.
- Model seen may be perceived as unattainable.



18) a) Identify two different mechanical items which might assist movement skill learning. 2 marks

**Answer:**

*Any two examples of mechanical aids to learning:*

- Support belt in trampolining.
- Stabilisers on bicycle.
- Arm bands in swimming.

b) Give reasons for the use of these mechanical items to help a learner come to grips with a motor skill. 4 marks

**Answer:**

*Give reasons:*

- Gives confidence to learner.
- Provides safety.
- Enables success.
- Builds up subroutines and enables part-learning.
- Gives an idea of the skill with similar kinaesthesia.

19) a) Define the term feedback, and briefly describe three functions of feedback. 4 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) How would you make feedback effective when teaching a motor skill? 4 marks

**Answer:**

*Effective feedback - 4 marks for 4 of:*

- Feedback must be accurate and well-informed.
- **Knowledge of results** is important.
- Be specific and selective with information (not too much information at a time).
- Make the feedback interesting to hold attention and aid retention.
- Information should be understood by the performer.
- Feedback should be given straight after the performance.
- Encourage **intrinsic feedback** or the feel of the movement (kinaesthesia).

20) Distinguish between intrinsic and extrinsic feedback. 2 marks

**Answer:**

- **Intrinsic** feedback is information received by the athlete as a direct result of producing a movement through the kinaesthetic senses such as feelings from muscles, joints and balance.
- **Extrinsic** feedback is from an external source to the performer that can affect performance.
- And either motivate or demotivate the performer depending on the quality of the feedback.
- It consists of **knowledge of performance** and **knowledge of results**.

- 21) Using figure 6.22 on page 85, what feedback might a coach give to the player (in the black kit) who has just played a forehand drive and is attempting to read his opponent's next shot. 3 marks

**Answer:**

- Look at current positioning of opponent in terms of stance, racket head position.
- Anticipate changes in his position, speed and posture.
- Which may give clues to shot selection.

- 22) Explain how feedback in a sports skill learning situation helps the sportsperson improve his or her performance. 4 marks

**Answer:**

4 marks for 4 of:

- Helps with motivation, and increases self-confidence.
- Helps with detecting and correcting errors.
- Reinforces correct actions or skills, so that the performer knows what to do.
- **Strengthens the S-R bond** in the learning situation, so that the correct movement is perceived by the sportsperson to be the correct thing to do.
- Reduces or prevents bad habits.
- Helps reduce likelihood of inhibition (drive reduction theory).

- 23) When we play sport we are given many different types of feedback by different people and they come in different forms. Evaluate the use of positive and negative feedback in sports performance. 6 marks

**Answer:**

*Positive effects of feedback:*

- **Positive feedback** is feedback which gives information aimed at a constructive development of a performance.
- Gives **reinforcement**, praise and encouragement about good performance.
- Thus establishing correct S-R bond and skill development.
- Praise and encouragement can **motivate** performance by building up performer's self-esteem and confidence.

*Negative effects of feedback:*

- Often takes the form of **criticism** on aspects of a poor performance without offering constructive feedback.
- That could **depress performance** and undermine the confidence of the performer.
- **Negative feedback** can support performance, especially during the autonomous stage of learning. For example, a coach could use a negative gesture to his or her athlete during a competitive situation. In this case the athlete could use this feedback to make the necessary adjustments to refine his or her technique.
- Negative feedback needs to be accurate and used only when necessary.

- 24) Discuss the idea that improvement in skill performance is dependent upon the nature and frequency of feedback provided by the coach.

8 marks

**Answer:**

*Note: provide a brief description of type of feedback (this information has been described in full). The main part of your answer needs to focus on discussing improvement of skill performance.*

- Feedback describes the way in which information is received by the performer about a performance, and is known as **knowledge of performance**.
- There are several different types of feedback that can be used to improve performance: **intrinsic**, **extrinsic** (or augmented feedback), **positive**, **negative**, **concurrent**, **terminal**, knowledge of performance and **knowledge of results**.
- Intrinsic or internal feedback, available as a natural consequence of performing an action, is internally received via proprioceptors (**kinaesthetic** information).
- It is what the performer subjectively **feels** about their performance.
- For example: What are the performer's thoughts and feelings (knowledge of performance) about their performance or training?
- **Extrinsic** or external feedback is received from external sources through vision and sound.
- It needs to be **immediate**, **precise** and **accurate**.
- **Knowledge of results** provides the performer about the **outcome** of the performance.
- If used correctly, it can **motivate** the performer.
- It can be **positive**, for example a coach gives praise to a tennis player when he or she serves a perfect serve.
- The coach would clearly indicate what was good about the performance.
- **Positive feedback** focuses on what the performer did well and suggests how further improvements could be made.
- Positive feedback will strength the **stimulus-response bond** (S-R) bond and will therefore reinforce learning.
- Positive feedback is particularly beneficial for learners at the **cognitive** and **associative** stages of learning.
- And so should be used frequently to reinforce learning.
- Once the performer has refined the skill i.e. autonomous stage of learning, less feedback is needed.
- However, some elite athletes become dependent on feedback.
- In most sports coaches are able to give feedback between rounds. In some sporting events, such as in Grand Slam tennis tournaments, coaches are not allowed to give concurrent feedback to their players.
- And so when feedback is withdrawn or cannot be given their performance may deteriorate.
- Giving **negative feedback** to someone is not always useful as it fails to explain how improvements can take place.
- However, it can be beneficial to elite performers when analysing faults, in addition to providing a **motivating influence** to improve performance.
- Negative feedback should be used sparingly as it could suppress performance.
- For example, a coach who repeatedly feeds back information about faults, and gives very little help about how to correct them.
- **Concurrent feedback** is received during the performance and it is particularly beneficial for continuous skill as it allows quick corrections to occur.
- For example, a coach tells a runner when they are halfway through a marathon that they are 10 minutes ahead of their personal best performance.
- **Terminal feedback** occurs after the performance either immediately or a while after.
- Immediate terminal feedback allows the situation to be addressed while it is fresh in the mind of the performer. For example, a coach evaluates the performance of a netball team at the end of the game.
- **Delayed feedback** gives the performer a chance to assess their performance.
- Therefore it is important that the coach gives good quality, relevant feedback to ensure that learning is positive.
- **Feedback**, about **movement errors**, is one of the most important aspects of the learning environment.
- Without it performers and elite athletes would have little understanding of how to correct their errors.
- Feedback is not the only factor that accounts for improvements in performance, which is also dependent on other variables.
- The most important learning variable is practice itself.
- Both the amount and quality of practice are important for effective learning.
- In summary, a combination of **feedback** and **practice** account for most of the improvements in skill performances.

25) **A Level.** Feedback is used by coaches to develop sports skills. Discuss how different types of feedback benefit from the use of technology.

15 marks

**Answer:**

- Feedback is a term which describes the way in which **information is received** by a performer about a performance either just completed, or sometimes **during** the performance itself.
- **Knowledge of performance** is a type of extrinsic feedback where information is obtained about a performance.
- For example, its quality, rhythm or aesthetics possibly from a video - any type of recorded performance - Iphone, Ipad, then computer to display split screens and or technical breakdown.
  
- Tactics and strategies can be reinforced by **GPS portrayals** of player movements and patterns of play.
- Benefits of this technical input are the almost **immediate** and **accurate** analysis of individual or team technical performance.
- This will identify strengths and weaknesses of individual or team **clearly**.
  
- **Knowledge of results** is a type of extrinsic feedback in which a performer has information about the outcome of a performance.
- Such as success or failure, or the distance, height or time performed.
- Technical input comes from automated measuring devices such as photocell triggered timing devices, automated distance measuring devices.
- The benefit to the performer is it is **immediate**.
- This type of extrinsic feedback does not encourage as much **kinaesthetic** awareness.
  
- The immediacy of this feedback could then lead to intrinsic feedback because the performer will be able to directly **relate** the outcome to the **internal feelings** or rhythms experienced by the performer.
- This then acts as **reinforcement** of the **correct** feeling or rhythm.
  
- In certain situations, this can be used for **error detection** as a movement is in progress, by the comparison of the shape of the skill with the **perfect model** stored in the memory.
- If the performer is in the **autonomous** stage of learning, a performance is likely to be **more accurate**, and reinforces itself.