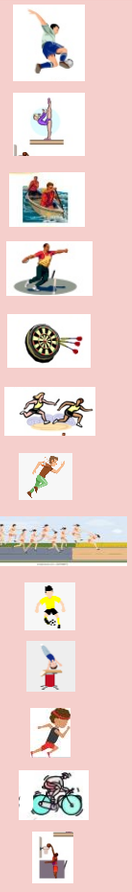
Skill Acquisition

-Classification of Skills, Types and Methods of Practice, Transfer of Skills, Stages of Learning, Guidance & Feedback, Memory Models

Skill Classification	
Open Skill	They are affected by the environment and occur when performers have to make decisions and adapt their skills to a changing or unpredictable environment
Closed Skill	They are not affected by the environment and are determined by the player and don't have to be adapted as the environment is changing
Externally Paced Skills	Those where the speed at which you perform are controlled by the environment which could also mean an opponent
Self Paced Skills	Those where the rate at which you perform is determined by you
Fine Skills	Involves intricate movements using small muscle groups
Gross Skills	Involve large muscle movements, they are not very precise and require more movement to produce power
Continuous Skill	Do not have a clear beginning and end, they are repetitive and on going
Serial Skill	Have several discrete elements that are then performed in a patter or sequence of movements
Discrete Skill	Have a clear beginning and end
Complex Skill	Requires a lot of decisions to make
Simple skill	One that has a low perceptual load as there are not many decisions to be make
High Organisation	Sub routines are closely linked and difficult to separate
Low Organisation	Subroutines that can be easily separated

Examples



Skill Mastering

Efficient	No waste of energy, the movement seems effortless
Fluent	Flowing and fluid movement
Consistent	Being able to perform the desired action repetitively to get the same outcome
Controlled	Movements are exact and deliberate
Predetermined	The performer is able to achieve the movements they purpose to do
Creative	The performer uses imagination to get a successful outcome
Speed	The ability to complete movements quickly
Confidence	Believe in the performers ability to complete the required movements
Aesthetically Pleasing	The movement is pleasing and looks good
Coordination	Well timed
Technique	Excellent technique model

Mastering a Skill

- If someone has mastered a skill they are efficient, fluent, consistent, controlled, predetermined, creative, quick, aesthetically pleasing, confident, coordinated and technical
- Being a top sports performer is something you are both born with and you learn yourself.

Skill

Continuity	Difficulty	Organisation
• Continuous • Serial • Discrete	• Complex • Simple	• High • Low

Types of Transfer

Positive	One skill helps another
Negative	One skill hinders another
Proactive	A previously learnt skill has an impact on a newly learnt skill
Retroactive	A newly learnt skill has an impact on a previously learnt skill
Bilateral	Being able to do the skill with both sides of the body

Types of Transfer	Transfer
- Positive – Negative - Retroactive- Proactive - Bilateral	The influence of one skill on another, can be influenced from a previously learnt skill on a new skill, this can help or hindrance a performance.

Cognitive Theory of Learning

Cognitive Theory of Learning	A gestaltist view of learning where the skill should be learnt in its entirety using whole practice
Insight Learning	This is using problem solving and using memory of effective experiences to solve a new challenge
Intervening Variables	These are the mental process involves in decision making

Thorndike's Law

Law of Exercise	Skills improve through training so you train with more focus
Law of Effect	Positive outcome or satisfaction from practice makes you continue
Law of Readiness	You need to be physically and mentally strong enough to do the skill you are practicing or learning

Type of Practice

Whole Practise

The skill is practiced without any breakdown of the subroutines, the skill is carried out in its entirety

+	-
• Helps gain kinesthesis or feel for the skill • Good for older or more experienced or serious performers • Good for continuous skills	• Difficult to refine or correct specific parts • Not good for potentially dangerous skills • If not skilled or not physically a bale or mature or if skill is very difficult

Part Practise

The skill is broken down into subroutines and a particular part of the skill is practised

+	-
• Gives early success so raises confidence or esteem • Good for beginners • Good for performers with limited motivation or attention	• Do not experience; the whole skill and feel of complete movement • Can lead to lack of fluency • Can be boring or de-motivating for highly skilled performers

Whole-Part-Whole Practise

Whole is to engage, part is to isolate a certain bit then whole is putting it all together again

+	-
• Learner gets to experience whole skill • Allows only the weak parts of the skill to be highlighted • Therefore can be quicker than part method	• Not good for highly organised skills • Not suitable for dangerous skills • Unsuitable for beginners

Progressive Practise

Each subroutine is seen as the links in the chains.. The first link is practised, then the second link is practised, these are then practised together before the third link is added

+	-
• Good for serial skills	• Can lead to lack of fluency

Methods of Practice

Fixed Practise

Practise which is done in a stable and predictable environment. This is good as it allows a performer to focus entirely on the technique of the skill.

+	-
• Gain muscle memory • Good for perfecting skills	• Tedious • Overuse injuries • Doesn't promote decision making

Massed Practise

A continuous practise session. It is good for some gross skills to build strength and delay fatigue. Can be good for experienced athletes who can self motivate well.

+	-
• Develops fitness during skills activity • Good for simple/discrete	• Can get boring • Physical and mental fatigue • Lead to injuries

Distributed Practise

A continuous a practise session that involves rest intervals which could be used for feedback or tasks that are unrelated to the session. Also allows for mental rehearsal of skills and can be good for a beginner.

+	-
• Prevents muscle injuries • Mental practise	• Disrupts concentration • Demotivating

Varied Practise

Practise which is done in a more unpredictable and changing environment. Helps a performer to improve decision making and gain more experience performing the skill in various situations.

+	-
• Use different activities and environments • Maintains motivation	• May be difficult to adapt • Demotivating

Learning Theories

Operant Conditioning	This is learning using trial and error and conditioning the most effective response through practise
Cognitive Theory of Learning	This is learning by doing the whole skill and using problem solving to work out how to most effectively perform the skill
Social Learning / Observational Learning	This is learning through watching and copying others
Reinforcement	This is used to strengthen an stimulus-response bond and therefore increase the likelihood that the behaviour will occur in the same way again
Thorndike's Law	These laws were developed to help strengthen the stimulus response bond when using operant conditioning as a learning method

+	-
• Performer can become more independent and self correct during a game • They can adapt better to different situations • They could make quick progress, they develop kinesthesis	• Using whole practice might be a problem if the skill is too difficult or dangerous or if the performer is a beginner • Learning could be slower if the performer doesn't understand what to do and therefore might lose motivation • Might not have any past experiences to draw on

Operant Conditioning

Positive Reinforcement	This is when a stimulus is given after the correct response. Usually in the form of praise or a reward
Punishment	This is when a stimulus is given to prevent a response occurring such as a forfeit or something else unpleasant
Negative Reinforcement	This is when an unpleasant stimulus is withdrawn after the correct response

Bandura's 4 Process

1	**Attention –** The performer must be paying attention to the demonstration
2	**Retention –** The performer must be able to remember the demonstration
3	**Motor Reproduction –** The performer must be physically and mentally able to carry out the skill being demonstrated
4	**Motivation –** The performer needs to want to carry out the skill

Stages of Learning

Cognitive	Lots of trial and error which means lots of mistakes, movement is jerky, uncoordinated and inconsistent, lack of fluency and needs extrinsic input as lack of kinesthesis
Associative	Reduction in mistakes and trails and error. Movement is becoming more fluent and consistent. Performer is developing kinesthesis, tends to be the longest phase of learning and some will never leave it
Autonomous	Movement is fluent, accurate and habitual, little to no conscious thought about the movement, instead attention can be given to tactics and adaptations

Types of Guidance

Verbal Guidance

+	-
• More effective for higher associative / autonomous learners • Questioning techniques can lead to effective learning • Can be motivational and give confidence	• If inaccurate it can lead to incorrect performance • Can be too much for the performer if a beginner and therefore not effective • Can be boring

Mechanical Guidance

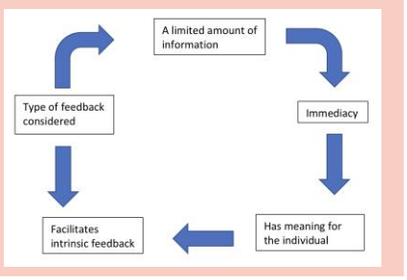
+	-
• Can reduce fear • Can be useful for all levels • Can be used to isolate a particular part of the skill to practise or develop	• Can lead to a false sense of kinesthesis • Can restrict the performer so that they are not able to fully perform the skill

Visual Guidance

+	-
• Helps the performer create a mental image • Coach can cue the performer in • Is good for beginners • Courage's observational learning	• It may be too quick for the performer to process • Demonstration could be unclear to the performer • Static images don't show how the movement is produced

Manual Guidance

+	-
• Can reduce fear • Can improve confidence and motivation • Can promote kinesthesis • Give a clearer understanding of how to perform the skill • Use to isolate a skill	• Can lead to a false sense of kinesthesis or intrinsic feedback could be incorrect • Performer can become too reliant on the support and not fully participate in performing the skill when practicing it which could reduce motivation



Observational/Social Learning Theory

- Similar age/sport/position/attitude/culture
- Models behaviour is reinforced/praised/rewarded
- Demonstration is high standard/accurate

Significant Others

These are people who are role models to us. They are important to us and therefore we are more likely to pay attention to them and copy their behaviour.

Memory Models

Memory is vital in learning new skills and tactics, however to be able to memorise and recall information is a complicated process

Types of Feedback

Extrinsic Feedback	This is from an external source such as a coach + This is very beneficial to a performer to improve their technique or use of tactics - If this is inaccurate or if it comes from an unreliable source then this could negatively affect the performers performance
Intrinsic Feedback	This is from an internal source such as our proprioceptors and is known as kinethesis + This is very effective as the performer recognises the feel of a skill when performed well
Positive Feedback	This can be both extrinsic and intrinsic + Highlights what went well in the performance and offers some sort of reward such as praise to the performer - If this type of feedback is overused it may lose its effects on the performer and if it is undeserved it could have a negative effect
Negative Feedback	It tends to focus on what wasn't successful in the performance + effective for some performers as it can be clear - It can be demotivating to some
Knowledge of Performance	This is feedback about the movements that the performer has carried out rather than the result of the movement + The performer can use this feedback yo improve their performance
Knowledge of Results	This is external and terminal feedback about the end result of a movement that the performer has carried out

Remembering

There are 3 Stages of remembering;
-Encoding
-Storage
-Retrieval

Encoding	Storage	Retrieval
This involves conversion of information into visual, auditory and semantic codes	This refers to relation of information over a period of time	This involves recovering the stored information, successful retrieval depends on previous experiences and how well encoded it was

Methods of Learning

Chunking	Information can be stored in the memory more easily if it is broken down into small pieces, so that relevant information can be focused on
Chaining	A coach should link information given to the performer. The first part of the task should be presented before going on to subsequent movement elements
Selective Attention	This is the process of sorting relevant pieces of information from the many which are received. Attention passes the information to the short term memory which gives time for conscious analysis
Rehearsal	Involves going over the task in your mind. It stimulates the brain and the associated muscle and so helps to store information in the long term memory

Memory Processing

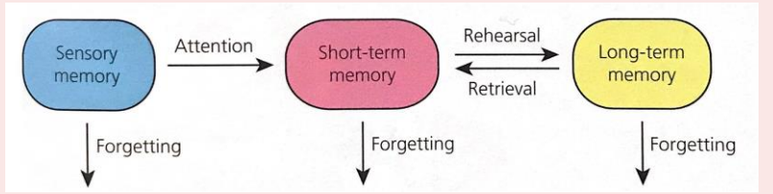
Rehearsal	A coach my encourage the rehearsal of a tennis serve both mentally and physically
Meaningfulness	A coach may explain a concept in a way the performer can relate to it better
Association	A coach may present some new information but linked to an old skill set to increase retention
Avoiding Overload	A coach should only present small volumes of information at a time
Organising Information	A coach may group complex pieces of information into smaller sub-routines
Mental Imagery Techniques	Visual representation will often be retained far easier

Memory Models

Selective Attention	Focus on relevant information and discard irrelevant information
Encoding and Decoding	Information is passed into the long term memory through a process of encoding and sent back to STM via decoding

Atkinson and Shiffen's Multi-Store Memory Model

The multi-store memory model involves all relevant information and cues passing through the short term memory, rehearsed and encoded into the long term memory.



Sensory Memory (SS)

This area of the brain which received information and holds it for a short time. If the information is deemed unimportant its lost and forgotten and replaced by new information.

- Selective attention happens here
- Capacity of this store is large
- Only filters information for up to 1 second

Short Term Memory (STM)

This part of the brain keeps information for a short period of time (20 – 30 seconds). It can hold between 5 and 9 pieces of information at one time. If not used the information is lost or passed o to the long term memory for permanent storage.

- This is the workspace of memory as info is processed
- Information is organised and processed
- Compassion is made with the LTM and response is selected to put into action via a motor programme

Long Term Memory (LTM)

The information is stored in the long-term memory in the form of a motor programme

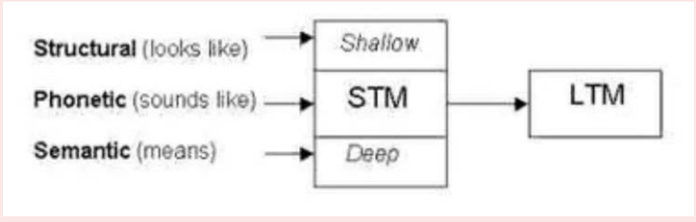
- Limitless capacity
- Holds information for long period of time
- Meaningless info not stored in LTM, only stores info that has meaning and is rehearsed
- Info is encoded to store in LTM and decoded to send back to STM for action
- If skill is more rehearsed it becomes more recognisable and automatic

There is a two way relationship between the short-term memory and the long-term memory. Information can be moved from one to the other when needed

Coding Information in the Long-Term Memory

Movement patterns can be stored in the long-term memory and used by the performer when needed. The coach can enhance the process of storing motor programmes in the long-term memory by making the player practise the taste repeatedly. Skills are more likely to be remembered if they are associated with other items already stored in the memory

Levels of Processing Model- Craik and Lockhart



This was made partly as a result of the criticism for the multi-store model. Instead of concentrating on the stores or structures involved, this theory concentrates on the processes involved in memory. Unlike the multi-store model, it is meaning of the information that determines whether it 'sticks'. The deeper the processing the longer the memory trace

Structural Processing

This is information encoded on the basis of its physical qualities

Phonemic Processing

Information encoded through sound

Semantic Processing

This is information processed by encoding the meaning of. Word and related it to similar words with similar meaning

Shallow Processing

Only involves maintenance rehearsal and leads to fairly short term retention of information. This is the only type of rehearsal to take place within the multi-store model

Deep Processing

Involves elaboration rehearsal which involves a more meaningful analysis of information and leads to better recall