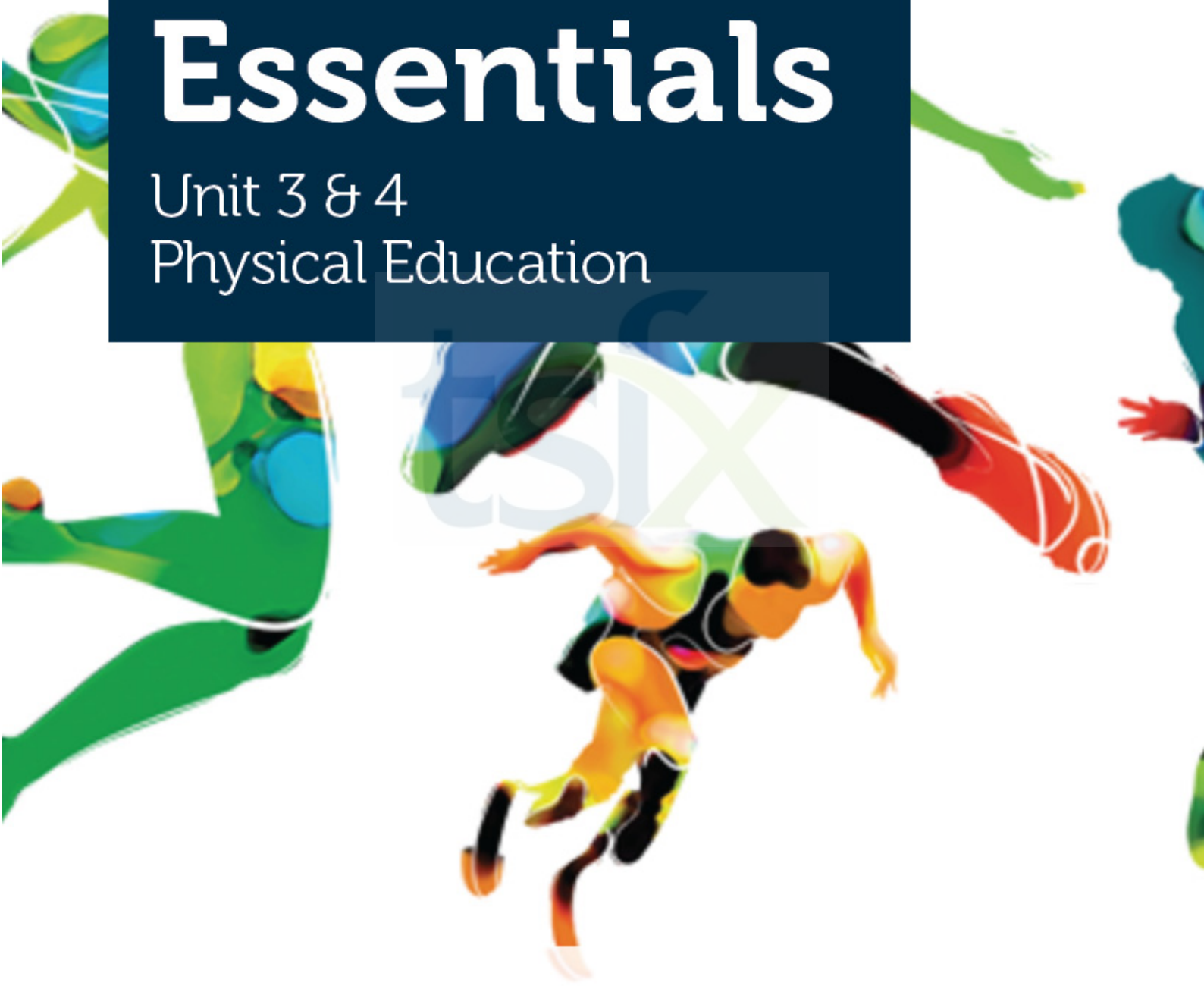


A+

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Unit 3 & 4
Physical Education



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VCE EXAM HIGHLIGHTS

Unit 3 & 4 Physical Education

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VCE UNIT 3 & 4 EXAM HIGHLIGHTS

VCE ACCREDITATION PERIOD: 2018 – 2024

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SECTION 1: UNIT 3
PHYSICAL EDUCATION

VCE PHYSICAL EDUCATION

ASSESSMENT DETAILS

UNIT 3

School Assessed Coursework (SAC) – Contribution to Study Score – 25%

UNIT 4

School Assessed Coursework (SAC) – Contribution to Study Score – 25%

EXAMINATION DETAILS – NOVEMBER

Contribution to Study Score – 50%

- 15 minutes reading time.
- All outcomes in Units 3 and 4 will be examined.
- All outcomes from Units 3 and 4 will contribute approximately equally to the examination.
- 15 Multiple Choice – approximately 14 Short Answer questions including one Extended Answer question.
- Generally, each question has increasing complexity.
- Marks reflect the depth required in answers.

A variety of stimulus material is used throughout the examination paper (graphs, diagrams, pictures, etc.)

UNIT 3: MOVEMENT SKILLS AND ENERGY FOR PHYSICAL ACTIVITY

AREA OF STUDY 1 – HOW ARE MOVEMENT SKILLS PRODUCED?

Key Knowledge

- Classification of movement skills including fundamental movement skills, sport specific skills, open and closed
- Skills, gross and fine skills, and discrete, serial and continuous motor skills
- Influences on movement including individual, task and environmental constraints on motor skill development
- The link between motor skill development and participation and performance
- Qualitative movement analysis principles (preparation, observation, evaluation and error correction)
- Biomechanical principles for analysis of human movement including:
 - Angular and linear kinetic concepts of human movement: Newton's three laws of motion, inertia, mass, force, momentum and impulse
 - Angular and linear kinematic concepts of human movement: distance, displacement, speed, velocity, acceleration and projectile motion (height, angle and speed of release)
 - Equilibrium and human movement: levers (force, axis, resistance and the mechanical advantage of anatomical levers), stability and balance (centre of gravity, base of support and line of gravity)
- Direct and constraints-based approaches to coaching and instruction
- Sociocultural factors that have an effect on skill development, and the characteristics of the three stages of learning (cognitive, associative and autonomous)
- Practice strategies to improve movement skills including amount, distribution (massed and distributed) and variability (blocked and random)
- Feedback including type (intrinsic, augmented, knowledge of results and knowledge of performance) and frequency.

AREA OF STUDY 2 – HOW DOES THE BODY PRODUCE ENERGY?

Key Knowledge

- Fuels (both chemical and food) required for re-synthesis of ATP at rest and during physical activity, including the relative contribution of fuels at varying exercise intensities
- Characteristics of the three energy systems (ATP–CP, anaerobic glycolysis, aerobic system) for physical activity, including rate of ATP production, the yield of each energy system, fatigue/limiting factors and recovery rates
- Associated with active and passive recoveries
- Interplay of energy systems in relation to the intensity, duration and type of activity
- Oxygen uptake at rest, and during exercise and recovery, including oxygen deficit, steady state, and excess post-exercise oxygen consumption
- Acute physiological responses to exercise in the cardiovascular, respiratory and muscular systems.



UNIT 3: MOVEMENT SKILLS AND ENERGY FOR PHYSICAL ACTIVITY

AREA OF STUDY 1 – HOW ARE MOVEMENT SKILLS PRODUCED?

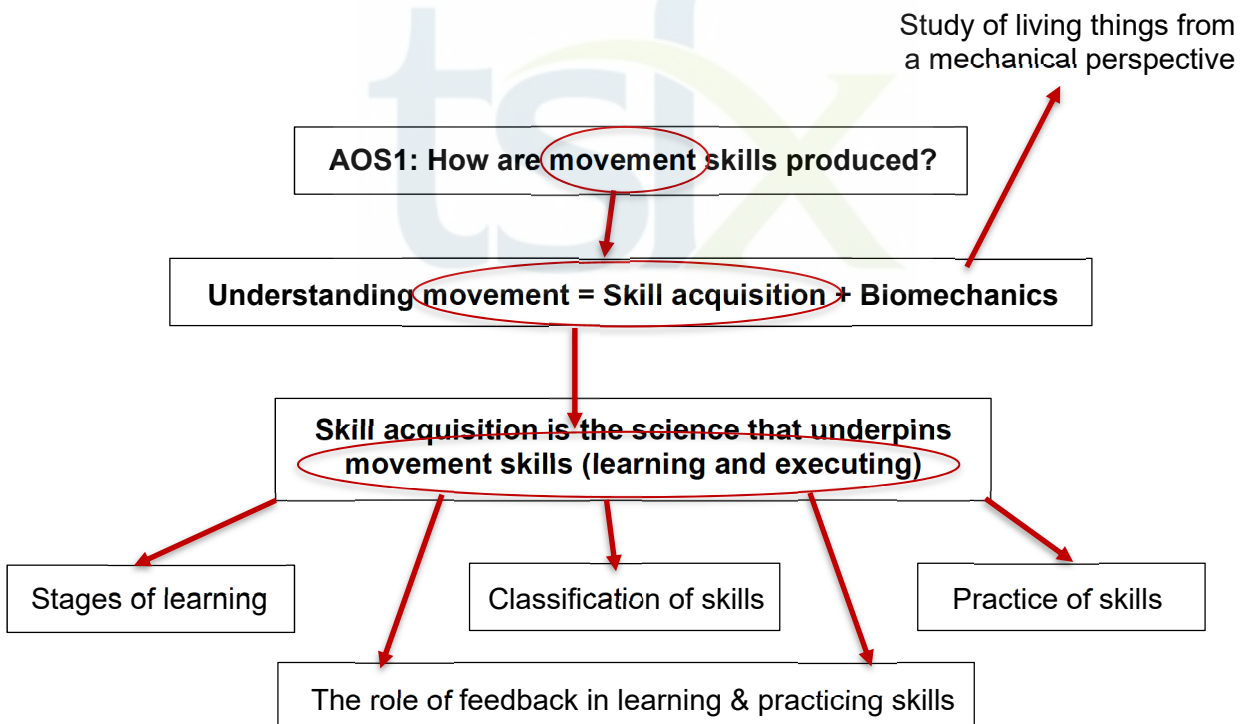
The following statement comes from the VCAA Study Design on what concepts students are expected to develop an understanding of during Unit 3 Area of Study 1.

In this area of study students examine the biomechanical and skill acquisition principles that can be applied when analysing and improving movement skills used in physical activity and sport. Through coaching and involvement in a variety of practical activities, students investigate and analyse movements to develop an understanding of how the correct application of biomechanical and skill acquisition principles leads to greater efficiency and accuracy in movement skills.

The two key concepts studied in Area of Study 1 are:

- Skill acquisition principles
- Biomechanical principles

The following diagram outlines where these two concepts fit:



CLASSIFYING MOVEMENT SKILLS

What is skill?

Skill can be defined as the ability to do something well.

What is a motor skill?

A motor skill is a 'voluntary goal-directed activity that we have learnt through practice and experience and require the movement of the body or limbs to achieve the goal.' (Spittle 2013)

Why do we need to classify movement (motor) skills?

This allows us to understand the demands of a particular movement to best prepare for to improve this movement through coaching, practice and training.

Movement skills can be classified into three categories according to their:

- Movement precision (Gross, Fine)
- Type (Discrete, serial, continuous)
- Predictability according to the environment they are produced within. (Closed, Open)

MOVEMENT PRECISION

GROSS MOTOR SKILL:

One that utilises large muscle groups and generally results in the production of a forceful or powerful movement.

Example: Weight lifting, Golf drive, Shot Put.

FINE MOTOR SKILL:

One that utilises smaller muscle groups, where precision is important.

Example: Dart throw, Golf Putting, Archery.

Note: Most skills will involve components that use both gross and fine movements, therefore students must be able to distinguish between which parts of a skill rely on gross and/or fine movements.

TYPE OF MOVEMENT

DISCRETE:

One distinct movement with a clear start and end point.

Example: Throwing, catching, kicking a football.

SERIAL:

Several discrete movements linked together in an order or routine.

Example: Serve in tennis, Gymnastics floor routine, various surfing manoeuvres on a wave.

CONTINUOUS:

Repetitive movement with no distinct beginning and end.

Example: Swimming, cycling, running.

PREDICTABILITY OF ENVIRONMENT

CLOSED:

A self-paced skill performed within a predictable/stable environment.

Example: Shooting a free throw in basketball, Playing darts

OPEN:

An externally paced skill performed in a changing and un predictable environment.

Example: Attempting to take a contested mark in AFL, attempting to receive a serve in tennis.

The role the environment plays in the performance of movement skills will see skills placed on a continuum based on the level of influence on the timing and control the performer has over the movement.



APPLIED EXAMPLE

Use the photo below to describe the movement skills occurring within this photo.



http://content.quiksilver.com/www/soap.quiksilver-europe.com/html/upload/news/upload/19032017063951peterson_l6410roxygc17cestari_n.jpg

On the predictability of environment continuum, surfing sits towards the open end of the continuum. This is due to the largely unpredictable nature of the surf environment, whereby the surfer's timing is dependent upon what the surf does (externally paced) which is often changing.

The surfer's movements, as evidenced in the photo are forceful (producing the splash of water on the turn), utilising a range of large muscle groups such as the gluteals, quadriceps and hamstrings, making this a gross motor skill.

The surfer links together a series of discrete skills such as, turns, cutbacks, aerial manoeuvres and sometimes tube rides in a routine for the judges to score, making this a serial performance.

QUESTION 1

Watch the Snowboard Cross event and describe the movement skills occurring within this event.

FUNDAMENTAL MOTOR SKILLS

What?

Fundamental Motor Skills (FMS) are foundation skills that provide the basis of more complex, sport specific skills.

FMS' can be broken into three categories:

- Locomotor skills
- Manipulative skills
- Stability skills.

Examples of each:

Locomotor	Manipulative	Stability
<ul style="list-style-type: none">• Running• Jumping• Crawling• Rolling	<ul style="list-style-type: none">• Throwing• Catching• Striking• Kicking	<ul style="list-style-type: none">• Balancing• Twisting• Turning• Bending
Example of a complex skill that is derived from this FMS'	Example of a complex skill that is derived from this FMS'	Example of a complex skill that is derived from this FMS'

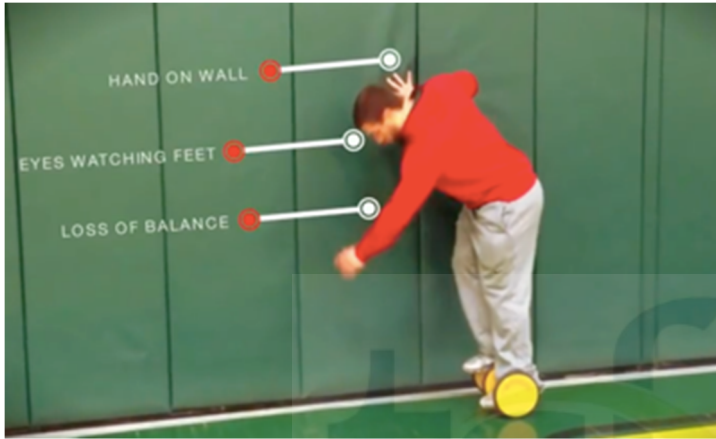

QUESTION 2

Describe the importance of young children learning FMS by referring to the completed table above.

STAGES OF SKILL LEARNING

By understanding that all sportspeople progress through three distinct stages of learning allows appropriate feedback to be provided and practice to be specially tailored to suit the needs of the performer.

The following example demonstrates the skill of learning how to use a step cycle.

Stages of Learning	Characteristics of this Stage
<p>Cognitive Stage (Understanding stage)</p> 	<ul style="list-style-type: none"> • Stage involves obtaining a mental picture of the movement. • Requires significant mental effort. • Large number of errors. • Jerky, non fluent movement. • Trial and error learning. • Extrinsic feedback required.
<p>Associative Stage (Practice stage)</p> 	<ul style="list-style-type: none"> • Fluency is increased over cognitive stage. • Fewer errors. • Knowledge of results and performance becomes important. • Performers spend significant time in this stage.

Autonomous Stage (Automatic stage)



- Skill becomes overlearned and requires minimal mental attention.
- Fluency and smooth action is visible.
- Errors are infrequent.
- Performer turns their attention to the environment; identifies and responds accurately to cues.
- Is able to provide and respond to self feedback.
- Tactical focus on how best to apply the skill in the game.

Learning Activity – Juggling

<https://www.youtube.com/watch?v=kCt1bmSASCI>



- Use the clip to attempt to three ball juggle.
- As you complete 10 minutes of practice, scan the room to watch other learners.
- After 10 minutes, describe what stage of learning you are in by providing examples of your performance.
- Contrast your performance with that of someone in a different stage of learning to you. Justify why this is so.

PRACTICE STRATEGIES

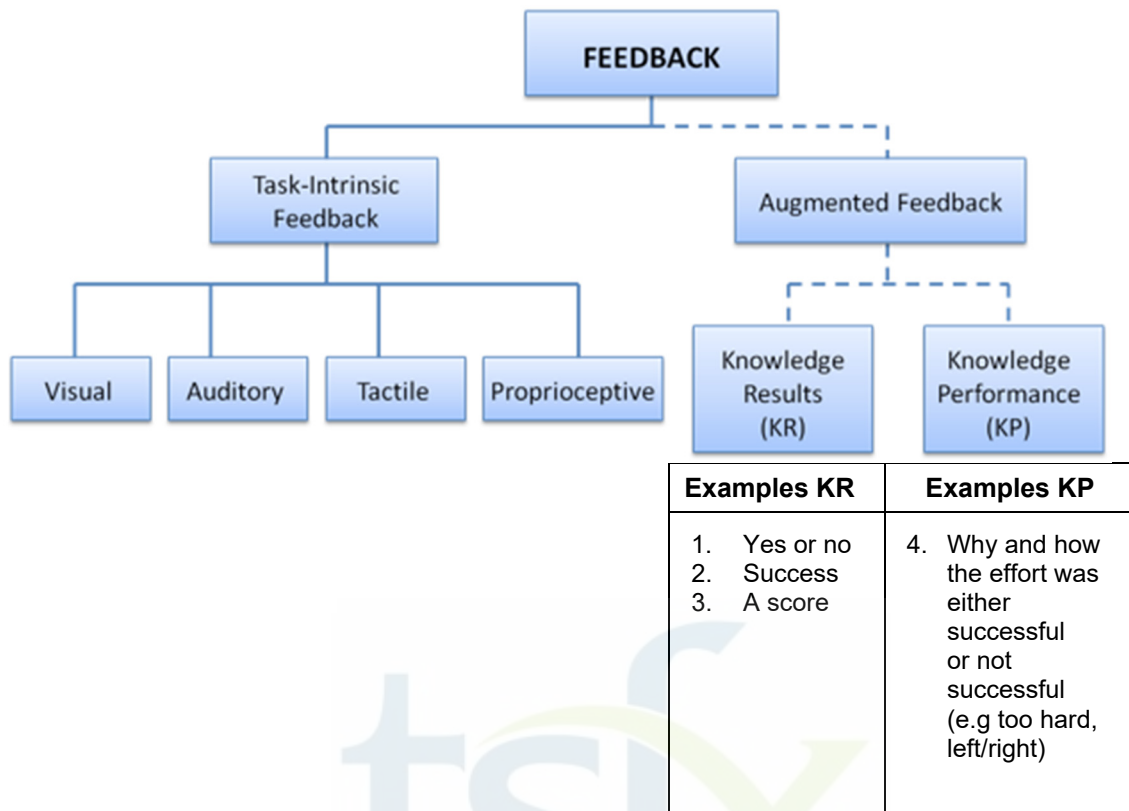
While practice is arguably the most important component in the learning and performance of all movement skills, the right type and structure of practice is vital for it to produce the most improvement.

PRACTICE STRATEGIES

		PRACTICE VARIABILITY 'How many skills are within a drill/session'		PRACTICE DISTRIBUTION 'Frequency and length of sessions' OR: 'Length of drills within a specific practice session'		TYPE OF PRACTICE 'How to practice an individual skill'																			
	Blocked Practice	Random Practice	Massed Practice	Distributed Practice	Whole Practice	Part Practice																			
What is it?	Performing the same skill continuously without performing a different skill.	Performing different skills in the same drill.	Less frequent but longer training session. Longer drill (repeated skill repetitions) with minimal rest periods	Shorter, but more frequent sessions. Shorter drill, with frequent rest periods.	Practicing the whole skill as one discrete movement.	Breaking a skill down and practicing it in several distinct parts.																			
Examples	Completing 20 free throws in basketball.	Completing leading, marking, handballing and kicking in the same AFL drill.	<table border="1"> <caption>Minutes of Instruction Per Day on New Skills</caption> <thead> <tr> <th>Day</th> <th>Less elite (community) performers</th> <th>Full time professional athletes</th> </tr> </thead> <tbody> <tr> <td>Mon.</td> <td>30</td> <td>20</td> </tr> <tr> <td>Tues.</td> <td>30</td> <td>20</td> </tr> <tr> <td>Wed.</td> <td>0</td> <td>10</td> </tr> <tr> <td>Thurs.</td> <td>10</td> <td>10</td> </tr> <tr> <td>Fri.</td> <td>10</td> <td>10</td> </tr> </tbody> </table>		Day	Less elite (community) performers	Full time professional athletes	Mon.	30	20	Tues.	30	20	Wed.	0	10	Thurs.	10	10	Fri.	10	10	Bowling a cricket ball. Hitting a baseball.	Practicing the ball toss in a tennis serve. Practicing a vault routine in gymnastics.	
Day	Less elite (community) performers	Full time professional athletes																							
Mon.	30	20																							
Tues.	30	20																							
Wed.	0	10																							
Thurs.	10	10																							
Fri.	10	10																							
Best for which performers/tasks?	Performers in the cognitive stage attempting to understand the skill.	Performers in the associative and autonomous stage.	Scheduling of sessions: Less elite (community) performers who have limited time. In session: A cognitive learner needing high repetition to understand the skill. (*type of skill dependent)	Scheduling of sessions: Full time professional athletes. In session If the skill is physically demanding & rest periods between performance is needed. Young performers where attention might be short.	Skills/movements where the task organization (how dependent each part of a movement is on the others) is high.	Skills movements where there is a high dependency on the previous movement.																			

FEEDBACK

The information that a performer receives about the outcome of a task they have performed.



https://www.nzca.com/uploadedImages/NSCA/Resources/Images/Education/Hot_Topics/Figure%202.%20Feedback%20Model.png

LEARNING ACTIVITY

TASK 1

- Wearing a blindfold, punt kick a tennis ball to a partner.
- Using only internal (intrinsic) feedback, predict whether the ball has gone straight, left, right, too short, too far.

TASK 2

- Two groups.
- Group 1: Wearing a blind fold throw 10 darts at the felt dart board, aiming for the bulls eye only. Subject is provided with knowledge of results feedback – score only, in between each throw.
- Group 2 – Same as above, except the subject is this time provided with knowledge of performance feedback in between each throw.
- Discuss which group performed better (number of bull's eyes or score closest to the bulls eye).

QUESTION 3

Use the picture below and suggest what dialogue is being discussed by the coach by referring to Knowledge of Results and Knowledge of Performance.



QUALITATIVE MOVEMENT ANALYSIS – AN INTRODUCTION

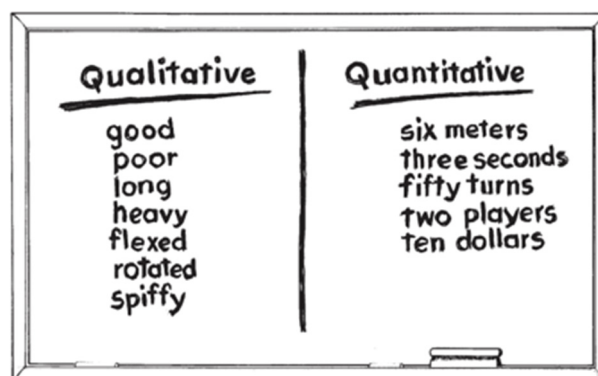
1. Qualitative movement analysis is the description of the quality of human movement without using numbers.
2. Qualitative movement analysis is used to improve human movement.
3. Qualitative movement analysis can be used by teachers, coaches, athletic trainers, sports medicine professionals.
4. It is used to diagnose strengths and weaknesses, obtain a rank within a competition (judging), to talent identify for team selection or to predict future performance.
5. The four main principles are preparation (to observe), observation, evaluation and error correction.

QUANTITATIVE MOVEMENT ANALYSIS

Analysis of human movement involving numbers.

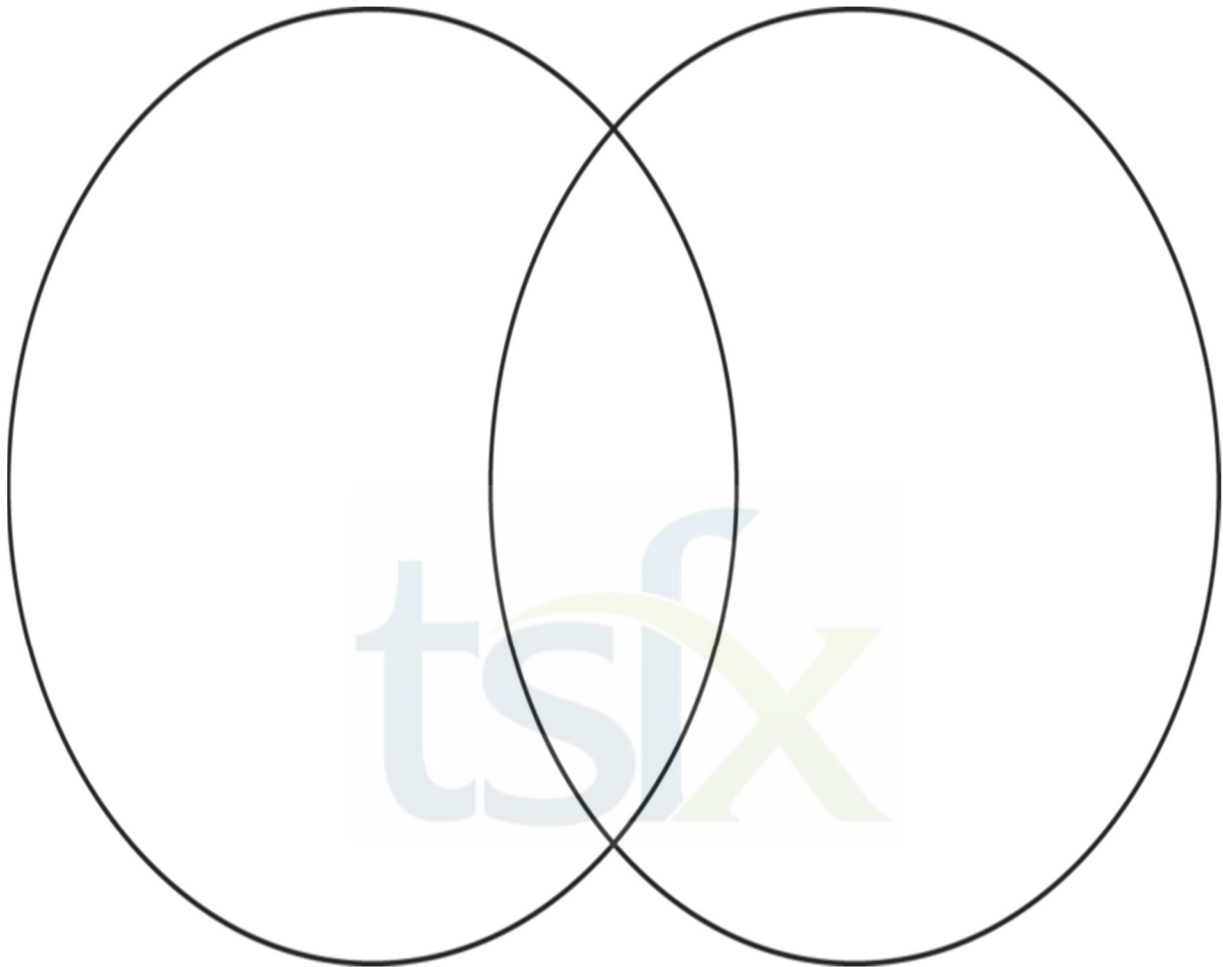


Quantitative analysis most commonly refers to assessments in sport science/lab-based settings relating to biomechanics or physiological data measurements.



QUALITATIVE VS QUANTITATIVE ASSESSMENT OF HUMAN MOVEMENT

Complete the Venn Diagram below to identify the difference in the assessment of human movement.



There are a number of factors/disciplines that are included within a qualitative movement analysis of the performance of a particular skill, including;

- Psychology (Identifying correct cues and dealing with the perceived pressure of a situation).
- Environmental conditions.
- Technique.
- A coach/teacher must weigh up any potential error and determine whether the error is common.
- To correctly identify the causes of the problem, a coach/teacher needs to possess a variety of knowledge from areas such as;
 - Biomechanics
 - Pedagogy (ability to teach a skill and how the skill is being taught)
 - Motor learning and development
 - Psychology

THE QUALITATIVE MOVEMENT ANALYSIS PROCESS



EXAM ADVICE

VCAA requires students to have an understanding of the stages of a qualitative movement analysis of a particular performance; however, the focus of questions will be on the evaluation and error correction stages.

Students are likely to be provided with a description &/or picture of a performance and asked to apply skill acquisition and biomechanical principles to describe the performance &/or provide suggestions for correction of the performance.

SUMMARY OF THE STAGES OF A QUALITATIVE MOVEMENT ANALYSIS

Preparation	Observation	Evaluation	Error correction (intervention)
<ul style="list-style-type: none"> - What is the purpose of the observation? - What will be observed? How will it be observed (equipment?) - The critical features of the skill? What does skilled performance look like? - Information about the performer(s) – physiological /psychological - What other variables need to be considered – environment? Referee errors. 	<ul style="list-style-type: none"> - The actual recording of the skill/movement - Organising the footage ready for evaluation 	<ul style="list-style-type: none"> - Reviewing the recorded observations by looking at data recorded in preparation - The quality of the performance is judged objectively (score, time) and subjectively by the perceived quality of the performance - Scoring/judging criteria often used in this stage. 	<ul style="list-style-type: none"> - Following interpretation of data observed strengths and weaknesses are identified - These can be categorised see Fig 1. - Strategies can be developed using either direct or constraint based coaching. - Intervention can occur during the game or via training – adaptation of training, meetings, visual footage.

APPLIED EXAMPLE – WORLD SURF LEAGUE JUDGING

Surfing is a sport where qualitative movement analysis forms the basis of competition. The judges are given the responsibility of making qualitative assessments of each ride and determining a score.

View clips of three different waves:

Wave 1: <https://www.youtube.com/watch?v=m0444S9bZH8>

Wave 2: <https://www.youtube.com/watch?v=631vWIVDwO8>

Wave 3: <https://www.youtube.com/watch?v=Fim3eh-VN78>

What makes scoring the wave difficult for the untrained?

Due to a lack of experience and training in watching and assessing surfing determining the quality of the performance is difficult. Also, not knowing the criteria for which to assess the quality also makes the assessment challenging.

Peak Performance Text p26 states; ‘The main limitation of observing the quality of performance is subjectivity’. List the factors below that would increase the subjectivity of the judging process of surfing.

- *Weather conditions from day to day and heat to heat.*
- *Different judges, their personality (psycho-emotional aspects) and experience.*
- *Expectations. Best in the world vs new to the circuit.*

What do the judges do each day to make their qualitative assessments more objective?

The judges observe the conditions before competition to ensure they are well informed on what the competitors are going to face so they can more accurately apply the criteria when assessing performance.

Describe intra judge reliability with reference to the judging process in surfing.

The ability of an individual judge to consistently rate a similar ride completed by a surfer over time.

Outline a process the World Surf League would use to increase intra judge reliability?

Training – By having each judge score a performance that the Head Judge has reviewed and scored regularly to ensure the correct and consistent application of the criteria.

Describe inter judge agreement with reference to the judging process in surfing.

The ability of a team of judges to use the set criteria in the same consistent manner to agree on a similar judgement of performance.

Outline a process the World Surf League has in place to increase the inter judge agreement during a competition.

Set criteria is in place for the judges to use for each and every performance, combined with the ability to review the first ride of the day for comparison, helps ensure inter judge agreement is increased.

A SUMMARY OF THE QUALITATIVE MOVEMENT ANALYSIS PROCESS FOR WSL JUDGES

PREPARATION – Preparing to observe

- *The judges will arrive early to view and consider the conditions*
- *The judges may be asked to review some rides prior to competition as part of training to ensure correct application of the criteria.*
- *Where will the cameras and scoring box be set up to ensure that the judges can accurately view the performance and have access to the required replays?*
- *Ensure the screens are set up so judges can not view other judges scores, to ensure observations are not affected by external factors.*

OBSERVATIONS – How will I observe and what am I observing?

- *What experience does the judge possess?*
- *Have they completed adequate training in application of the criteria?*
- *Are the criteria easy to apply, with very clear examples for the judges?*
- *Is the judge impartial with no contact with any of the competitors?*

EVALUATIONS – Making a judgement on the quality of the observation (performance)

- *Watching the performance carefully and consider the quality of the performance in line with the criteria.*
- *Use of the video monitor to review performance if requested to Head judge.*

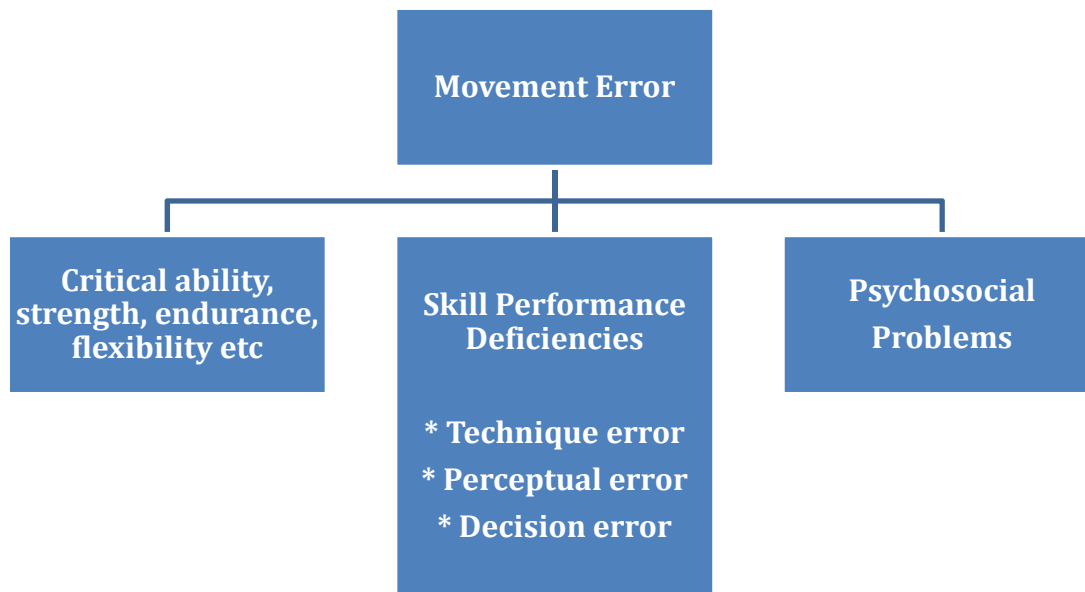


Figure 1 – Sources of movement errors

Discuss implications for error correction for the surfer themselves following qualitative assessments (judging) made during performance.

By knowing if the performance was excellent, good, fair, poor, will inform them during the heat to know whether to attempt a riskier routine.

Following performance, the coach can work with the athlete to look at footage and make changes to the performance.