

Examiners' Report  
June 2016

GCE Physical Education 6PE03 01

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June 2016

Publications Code 6PE03\_01\_1606\_ER

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## Introduction

Candidates who entered the 2016 A2 Level Physical education examination produced answers of a comparable standard to those who sat the examination in previous years.

There were some excellent candidates who achieved high marks, showing an in-depth learning across the specification, using well-reasoned arguments supported by relevant and often contemporary sporting examples.

However, in the extended answers, too many candidates used what felt like pre-planned answers rather than specifically tailoring their answer to the question on the paper. Candidates need to remember the relative weight the extended questions carry on this paper, particularly during their preparation for the examination and ensure they have the confidence to apply knowledge they have gained, regardless of the question – but tailored to the question given to them.

Candidates should read the questions carefully, work out what the questions demand, plan the answers meticulously and write responses which demonstrate that they have read the question and selected the appropriate knowledge and examples to support their points.

Too many candidates are also attaching unnecessary pieces of paper to their scripts. It would appear that in some centres all candidates had been encouraged to use an extra sheet – often this just had name and candidate number on but had not been used – these centres may want to consider the merits of missing out on the valuable, in depth analysis Results Plus can give a centre and help in the preparation for future series of examinations.

## Question 1 (a)

Candidates were able to answer this question well, often scoring two or three marks and were familiar with how creatine is useful for sports performers. The most common things that candidates were aware of were hypertrophy, though not all candidates used the technical terminology and sometimes said muscle mass, increased PC stores, relevant for high intensity activity and delaying of lactic acid system or increased power and strength. Candidates were not familiar with its ability to boost levels of amino acids.

1 (a) Identify **three** advantages of **creatine loading** on sports performance.

(3)

1 Allow's athletes to perform at a higher intensity for longer.

2 Can help <sup>increase</sup> ~~improve~~ muscle size

3 Increases muscular strength due to increased muscle mass.



**ResultsPlus**  
Examiner Comments

This candidate has given a good example of how to answer the question clearly. It is laid out well and makes three clear points from the mark scheme

## Question 1 (b)

Some candidates did not discuss the disadvantages of Creatine loading as successfully as other. Candidates sometimes wanted multiple marks for weight gain, bloating, feeling heavier, water retention which were all classed as the same point on the mark scheme. However, the points about being banned in countries (e.g France) , not knowing the long term effects, and it not being as useful for aerobic athletes were common answers among the more able candidates. The other points on the mark scheme were less well used and some candidates used the term side effects on it's own which was too vague to score any points as it was not substantiated with an example to support.

(b) Identify **three** disadvantages of **creatine loading** on sports performance.

(3)

- 1 limited as your body can only store a certain amount
- 2 Not very beneficial for aerobic athletes as it is used for power events.
- 3 little research on long term effects, some research suggests the water retention may cause cramping.



**ResultsPlus**  
Examiner Comments

Both examples score maximum marks and make their points clearly and concisely.

## Question 2 (a)

There was some confusion about the terms anxiety and arousal amongst weaker candidates. Some candidates were also drawn into talking about types of anxiety (cognitive and somatic) rather than giving a definition.

As a two mark question two distinct points needed to be made.

Examples were often known by candidates but unless they qualified this WITH a definition it did not score marks.

Very few candidates had learnt an accurate definition of anxiety. It is important that candidates learn definitions to any key words to save losing out on marks. More candidates were aware of the points about natural reaction than flight and fight. Only more able candidates added the part about the threat in the environment. Candidates tended to have learnt the definition or not.

2 (a) Define the term **anxiety**.

(2)

Anxiety is a natural response to threat from stimulus in the environment, it can have a negative impact on performance. It also prepares the body for flight or fight - stimulated by the autonomic nervous system.



**ResultsPlus**  
Examiner Comments

The examples shown all scored full marks



**ResultsPlus**  
Examiner Tip

Candidates must learn definitions to key words off by heart to avoid missing out on marks.

The examples shown all scored full marks

2 (a) Define the term **anxiety**.

(2)

Anxiety is a natural reaction to a threat to the environment  
part of our preparation for fight or flight (adrenaline)



**ResultsPlus**  
Examiner Comments

This is an example of a full mark response

2 (a) Define the term **anxiety**.

(2)

Anxiety is the body's natural reaction to a  
stimulus/perceived threat preparing the body  
for its fight or flight response.



**ResultsPlus**  
Examiner Comments

This is an example of a full mark response

2 (a) Define the term **anxiety**.

(2)

A natural ~~hate~~ reaction to a threat in our  
environment - it is part of our fight or flight  
response.



**ResultsPlus**  
Examiner Comments

This is an example of a full mark response

### Question 2 (b)(i)

Most candidates knew that state anxiety was in a specific situation. However some weaker candidates did confuse state and trait. In general, this question was very well answered. Candidates referred to the effect on performance e.g. choking, and often supported with an example. Taking a penalty was the most common sporting example used to support the point. The least used point in the mark scheme was the effect on arousal / anxiety.

(b) (i) Explain, using **one** example, how **state** anxiety affects sports performance.

(3)

State Anxiety is Anxiety in a specific situation which can lead to a drop in performance by over increasing arousal levels such as the somatic anxiety that Owen Putterell felt when taking free kicks for England - can easily be overcome through relaxation techniques such as centering and imagery



**ResultsPlus**  
Examiner Comments

The example shown scores maximum marks



**ResultsPlus**

Examiner Tip

Make sure the examples used are always very clear and are the best examples that can be used to support the point being made and not just from the sport the candidate loves!



## Question 2 (b)(ii)

Trait anxiety was not as well understood as state anxiety. Sometimes candidates knew the definition of trait, mentioning that it was a characteristic of personality, but then went on to use an example from a state situation. State based performance examples did not score marks. Few candidates mentioned that it could affect performance positively or negatively.

(ii) Explain, using **one** example, how **trait** anxiety affects sports performance.

(3)

Trait anxiety is a type of anxiety that is due to our personality. An athlete may get nervous before all competitions, no matter the <sup>importance</sup> size. This is more likely to be controlled by the athlete as they are aware of how to do so. This may lead to a slight <sup>increase</sup> ~~decrease~~ in performance or stay the same.



**ResultsPlus**  
Examiner Comments

The example shown scores maximum marks available

## Question 2 (b)(iii)

Those candidates who were able to identify an accurate strategy often went on to justify it appropriately. Weaker candidates explained the technique rather than justifying why it had been used. Most candidates scored very well on this question. All the points in the mark scheme were used by candidates although there was some duplication often of justifications between the two strategies, these were still credited.

(iii) Identify **two** strategies that can be used to successfully manage the influence of a crowd. For each strategy, justify your choice.

(6)

1 one strategy used could be ~~imagery~~ positive self talk. This is because it will help increase the players confidence and reduce anxiety. and ~~increase/decrease~~

2 Another strategy used could be ~~visualis~~ imagery. As this will allow the player to block out external factors such as the crowd and so get the player into his optimum crowd level.



**ResultsPlus**  
Examiner Comments

The two examples shown both succinctly and clearly make their strategies and justifications known and go on to score maximum marks.

1 Selective attention - this strategy can be developed in order for the performer to focus completely on what is important. By doing so will control arousal and anxiety levels to make sure they perform at optimal level and decrease chances of distraction.

2 Relaxation techniques - such as imagery and visualisation. Creating mental images in the mind will maintain focus on the competition ahead. Athletes may picture past success ~~at~~ or perfect model performances to maintain optimal arousal and not be put off by the crowd.



**ResultsPlus**  
Examiner Comments

This is an example of a full mark response.

### Question 3 (a)

Many errors were made in this question by candidates referring to a 2% drop in hydration or fluid rather than a drop in body weight. If body weight was not referred to then marks were not awarded for the percentages in the table on the mark scheme. Many candidates had understood that it would cause a decline in performance and that fatigue would set in. Most candidates were able to use the points increase in thirst, dizziness, headaches and heat illness points to pick up a large number of marks. The most able were more technical in their responses and could discuss the plasma volume decrease linking this to viscosity increasing and the subsequent changes to heart rate and blood pressure. There were some high marks awarded for this question. Some candidates confused whether BP was increasing or decreasing, and the same was true of blood viscosity.

3 (a) Identify the effects of dehydration on the body and explain how this affects sports performance.

(8)

Dehydration will result negatively on performance whatever the situation. Firstly water is used to transport vitamins, minerals and other vital substances around the body. If the body is dehydrated this will not work as efficiently. The body uses water for thermoregulation. When it's too hot, we sweat to cool ourselves down, but this causes dehydration, but also if we're not hydrated we can't do this, which could lead to heat stroke. We lose electrolytes through sweating, e.g. sodium which controls <sup>osmosis</sup> ~~osmosis~~. If these salts aren't replaced we get muscle cramps which will prevent and impair performance. The brain needs water to concentrate, if dehydrated decision making will be poorer, resulting in a poor performance. Water is vital to health and performance. 1% drop in body weight due to sweat will result in 5% drop in performance. 4% drop in <sup>body weight</sup> ~~performance~~ will result in 25% drop in performance, and thus 8%-10% drop in body weight can be fatal.



**ResultsPlus**  
Examiner Comments

The example shows a candidate who makes clear points and scores maximum marks for their response

### Question 3 (b)(i)

This was a straight forward definition question and although the exact words were not required, a large number of candidates were able to score both marks on this question as this was well understood and learnt.

(b) (i) Define the term **ergogenic aids**.

(2)

Ergogenic aids are substances or devices that enhance energy production, and that will enhance performance to reduce fatigue.



**ResultsPlus**  
Examiner Comments

The examples shown both score maximum marks



**ResultsPlus**  
Examiner Tip

Ensure candidates know all the definitions of key words off by heart. This means that straightforward marks can be rewarded.

(b) (i) Define the term **ergogenic aids**.

(2)

substance,  
A legal aid or device that enhances performance



**ResultsPlus**  
Examiner Comments

This is an example of a full mark response

### Question 3 (b)(ii)

In this question, many candidates failed to make the links between points as it was an 'explain' question, which meant they could not score the marks. Whilst this candidate did not score full marks they made some valid points and started to grasp the idea of linked points to explain.

Advantages were more commonly known than disadvantages. A lot of candidates picked up one mark for stating an advantage at the start such as they speed up recovery. The most commonly known disadvantages centred around shock and difficulty in accessing the ice, whilst all the points in the advantages section of the mark scheme were known by the most able.

(ii) Explain **one** advantage and **one** disadvantage of using ice baths as an ergogenic aid.

(6)

Advantage

They increase recovery <sup>rate</sup> in athletes as they experience a 'blood rush' within 6 minutes of the bath so this involves a large amount of oxygenated blood being sent to submerged muscles which allows recovery and repair after exercise.

Disadvantage

The cost of having ice baths as part of your training regime could pose a problem. A cryotherapy ice bath can cost up to £15,000 which could be spent on other training aspects, or simply financially finding the strings or purchasing of ice for long term use can be a disadvantage to athletes.



**ResultsPlus**

Examiner Comments

This response to Q3bii scored 5 marks



**ResultsPlus**

Examiner Tip

Candidates need to be taught how to make linked statements to explain. For example, a reduction in blood flow reduces muscle soreness.

## Question 4

More able candidates were clear on the difference between structural adaptations and functional benefits. However, weaker candidates are still confusing the two despite this having been a very popular topic at both AS and A2 for a long time.

The most commonly known structural adaptations were cardiac hypertrophy (but not all candidates are aware of the correct terminology), vascularisation or capillarisation, and increased red blood cells. Structural is better understood than functional. The most commonly used answers on the functional section were stroke volume and cardiac output increases, along with oxygen delivery to muscles.

### 4 Continuous training results in structural and functional adaptations.

Complete the table below.

(a) Identify **three structural adaptations** to the cardiovascular system due to continuous training.

(3)

(b) For each adaptation, explain **one functional benefit**.

(6)

Structural adaptation	Functional benefit
Increased Hypertrophy of the myocardium	This means the heart can pump out more blood per beat. This means it doesn't have to work as hard to supply the body with oxygen. Therefore it allows the athlete to train/compete harder and for longer, leading to an increased chance of success.
Increase in Capillarisation	This means more blood vessels surround the muscles, meaning more oxygen can diffuse into the muscles, and waste products can be removed quicker. This allows the athlete to train longer and harder, as the build up of lactic acid will start later, as the removal of waste products is more efficient.
Increase in red blood cell count.	This means there are more red blood cells in the blood, allowing the blood to carry more oxygen, therefore supplying the muscles with more oxygen quicker. It also means the heart doesn't have to work as hard, meaning the athlete can train for longer, as waste products are removed quicker, and the muscles are supplied with more O <sub>2</sub> , needed for energy.

(Total for Question 4 = 9 marks)



**ResultsPlus**  
**Examiner Comments**

This example is clearly laid out and well understood. There is clear understanding of structural and functional differences.

The candidate scored 9 marks



## Question 5

There were a lot of points available in the mark scheme for candidates to use. However, some candidates wrote about advantages of holding camps rather than disadvantages. The most common answers used talked about homesickness, issues with diets in the camps, media focus can create more pressure and perhaps poor team cohesion.

All points in the mark scheme were mentioned by candidates but very few candidates scored maximum marks on this seemingly straightforward question.

5 State **five** potential disadvantages of short-term holding camps prior to major sporting events.

1 Being kept away from families / friends can have a negative impact

2 Too much attention from the media can distract performers

3 Slight chance of <sup>negative impact on group cohesion</sup> ~~negative impact on performance~~ 's  
They've forced to spend a long time with each other

4 Spending too much time away from home could cause home sickness

5 Athletes work too hard due to increased motivation, so not enough rest before event



**ResultsPlus**  
Examiner Comments

This example does not score a maximum but scores 4 out of 5 marks.



**ResultsPlus**  
Examiner Tip

Be careful not to repeat points made and always make sure you have enough different points for the number of marks available.

5 State **five** potential disadvantages of short-term holding camps prior to major sporting events.

- 1 Loss of group cohesion - If groups are together they may grate on each other, in a team sport this may be crucial.
- 2 Anxiety build-up - Going to a holding camp may increase an athlete's anxiety levels before an event, as they realise its <sup>signi-</sup>ficance.
- 3 Break from training cycle - Different surroundings and facilities may result in a drop in an athlete's form.
- 4 Loneliness - Performers may miss family and friends which could lead to a loss of confidence.
- 5 Change of diet - Could upset athlete or affect performance, risk of food poisoning is high, especially in team sports - may be crucial.



**ResultsPlus**  
Examiner Comments

This example is clearly set out and scores maximum points

## Question 6

This essay really challenged candidates to use and apply their knowledge. More able candidates were able to focus on the important aspect of the question and stick to the topic of refining technique. The best answers were able to focus entirely on refining technique and included counter arguments. Students who read the word technology and wrote an essay on technology only found that they were not able to access band 2 of the mark scheme.

A lot of candidates were able to stick to the topic of refining performance and video analysis, comparison with the perfect model and force plates were the most commonly used examples to support the arguments. Those who focussed on performance enhancing technology but not on refining performance used examples such as compression clothing, ice baths and shark suits which were not relevant. Weak counter arguments centered around finance only and not specifically about issues to do with refining technique. Weaker essays listed technologies or described technologies and did not link this to refining performance. The better essays were able to talk about the best/perfect technique not necessarily being right for everyone, disagreement between coaches on the perfect technique and coaches being up to date with the latest techniques.

\*6 Discuss the use of technology to refine a performer's technique and its impact on their sporting performance.

(20)

Technology in sport has had a major impact in recent years. Technology is allowed to work on aspects of physiology, biomechanics, sports psychology and nutrition. A good technique is <sup>beneficial</sup> as it aids in enhancing performance, increasing the efficiency of energy use and power, while reducing risks of injury.

The use of biomechanics enables performers to be given feedback on their movements, associated with particular sporting actions. From this, performers and coaches can analyse ~~both~~ data and find new ways to refine technique in order to enhance performance. This could be done by changing the direction that the performer exerts force, their posture, in order to

find a more effective form, or by identifying average injuries in order to identify potential injuries associated with particular sporting actions.

Videos and computer software ~~is~~ used to provide detailed feedback on an athlete's performance, enabling them and their coaches to identify weaknesses and focus on these aspects in training to enhance performance.

Examples include Dartfish and ProZone. These commercial packages enable performers and coaches to construct images, so that they can identify with their own eye potential weaknesses in technique and focus on these specific body parts, creating a more effective form of training/analysis to develop a better technique, enhancing performance and reducing risks of injury. They can also overlap and superimpose in order to compare athletes at the same time, constructing data of the 'perfect model' and comparing techniques to this in order to clarify what specifically needs to change, e.g. transition, recovery, head/body position and so on. This is the most recognised way of identifying how to execute particular sporting actions e.g. Ronaldo's free kick stance.

The use of ergonomic aids helps performance and technique, even by refining clothing and equipment. The use of force plates provides feedback on fitness components. For example, power and endurance. If an athlete has low fitness levels in these aspects, they can develop specific techniques to help adapt their game to executing less power (concerning energy), or to find a technique that enables them to exert more power and perform at higher intensities. The use of pedometers could help in calculating energy expenditure. In terms of refining clothing, footwear can be designed to increase friction (grip) e.g. in football, or to reduce grip e.g. in spinning, thereby creating more efficient movement.

However, technology isn't just beneficial. Video and computer software may be seen as restricted in a sense that coaches don't necessarily have sufficient knowledge on what the right technique is, so using the images produced may be subjective/inaccurate. It is also very difficult to distinguish if there really is a perfect model or not. For example, Ronaldo (over) free kicks with his stance of hands down and legs wide apart before striking the ball,

but David Beckham swings his arm, and wraps his foot around the ball, yet he still scored plenty of goals from free kicks. Therefore, this could be subjective.

Ergogenic aids may not have an impact necessarily and could be seen as none of a placebo i.e. the performer psychologically feels that they have a better technique and are performing better, when really, they aren't. It's something they do to feel as though they have prepared in every way they could.

In my opinion, refining technique can be done in all of these ways. Equipment analysis is very useful and influential in developing correct or at least better techniques, however, I feel that it isn't about copying another performer simply because they are the best, but about finding the correct technique that you can execute well enough to perform at an optimum level e.g. with good transition, execution/recovery to suit you. Plus, technique varies in different sports and roles.



**ResultsPlus**  
**Examiner Comments**

This essay shows some good examples of counter arguments such as coaches not having enough knowledge and subjective opinions of coaches as different performers have different techniques.

This essay also includes lots of examples of different technologies and how they refine performance. It really focusses on the question and therefore scores at the top of band 3.

\*6 Discuss the use of technology to refine a performer's technique and its impact on their sporting performance.

PLAN und ~~turn~~ <sup>not sport</sup> swimmer's con  
DARTFISH ProSwim - ~~explains~~ = Coach feedback  
electromyography Michael Johnson  
Photography (20)

Technologies can help to shape athletes technique into that of a perfect models - which is the general accepted way of executing a skill/technique. One technology which can help to do this is DartFish. This software can superimpose one athletes, e.g tennis serve, ~~over~~ <sup>over</sup> a 'perfect serve', which helps athletes <sup>and coaches</sup> to clearly see the difference. \* see back

Another technology that can help to refine a swimmer's technique is a swimming flume. These 'mini pools' allow coaches to see the break down of a swimmer's stroke. For example, Michael Phelps coach uses this technology to help refine his technique, which may be a factor to why he is one of the world's best swimmers. However, ~~swim~~ athletes may swim differently in these flumes compared to a 50m pool, meaning that possibly ~~this~~ this technology isn't very competition specific - so coaches aren't actually detecting/analysing a swimmer's competition stroke.

Video analysis is another form of technology that can help to refine technique. ProSwim is one example of video analysis that swimmers can also use. This technology can record underwater, and allows



Swimmers to watch back their, e.g. turns, in slow motion, and <sup>it</sup> visually breaks down all aspects of the skill. However, this technology is very expensive, and so poorer nations may not be able to access this equipment, which could put them at a disadvantage.

Force plates can additionally be used by athletes to monitor the feet's technique, which could also help athletes recover from injuries. For example, when Jessica Knnis gained a foot injury in 2008, her physiotherapist adopted the use of a force plate to see if Jessica had fully recovered (it measured if both her feet were giving out the same force).

Photography can be used by coaches to help capture key parts of an athlete's technique. A sprinter may benefit from this because they may be able to watch in the photo's to see the break down of their transition from ~~the~~ start to finish in a more visual way, and then possibly work on ~~becoming~~ executing ~~the~~ the race more like the 'perfect models'.

Electromyography can help to analyse the movement of muscle contractions, which may help athletes and coaches to devise more specific training routines. For example, if a Javelin thrower was shown to contract more force from

their pectorals compared to their biceps, then a coach could aim to develop the athletes pectoral muscles more to improve performance. \*

In conclusion, it can be seen that technology has huge benefits in ~~improving~~ refining technique, such as through slowing down athletes technique so they can see more clearly any possible faults in technique. However, technology can ~~have~~ <sup>place</sup> too much emphasis on turning athletes into the 'perfect model', when this may not work for everyone. Take Michael Johnson, his running style is very 'upright' and may be considered wrong, but it works very well for him. Also, not all nations would be able to afford the same level of technology to improve ~~perform~~ technique, which gives some teams an unfair advantage. Sometimes, the use of verbal feedback can work the best for some athletes, as they may be more inclined to actually listen to what their coach is saying, over a type of technology.

\* Dartfish can also place several videos of athletes technique on a screen, which allows for visual analysis of several players technique at the same time.

<sup>2</sup>\* Cycling teams may also use wind tunnels to help see what parts of the bike/cyclist are the least aerodynamic. This could allow athletes to possibly change their riding positioning so that they are more streamline/~~also~~ aerodynamic when racing.



**ResultsPlus**  
Examiner Comments

This essay has counter-arguments (e.g. Michael Johnson) so this moves up to band 3. It also focusses specifically on refining technique. The counter argument is not quite as strong as the previous essay.

ProZone/Dartfish, wind tunnels, force plates, HR monitoring, pedometry  
\*6 Discuss the use of technology to refine a performer's technique and its impact on their sporting performance. GPS (20)

Technology has become a necessity in sport to help athletes refine a performer's/their personal technique and to help them achieve sporting success.

One of the main technologies which is used, mainly at elite level, is computer software systems like ProZone and Dartfish. These technologies allow for a performer's move to be broken down frame by frame in the different stages of a skill; preparation, execution, recovery. Now this helps is that it allows for the performer ~~to~~ and coaches to see a performer's technique, for example it may look at a tennis serve. It would then break the skill down frame by frame to see what's wrong with the technique, so that the coach could base training around this so that the tennis player is more efficient whilst performing a serve.

The second ~~technology~~ technology which has started to be used in cycling is wind tunnels. The wind tunnel shows how the wind flows over a cyclist's ~~body~~ body to show the aerodynamics of the cyclist. If the coach

sees that the performer is allowing there to be too much drag then they can obviously then sit the cyclist down and show them how to be more aerodynamic to take time off their races.\*

Force plates are another common technology in jumping events like triple jump and long jump. What the force plates show is that the amount of downward pressure the athlete is putting on the force plate. The coach or the jumper may ~~not~~ have an idealistic number for the athlete for them to achieve sporting success. And if the athlete doesn't reach this number, the coach will have to adapt the training to improve the power of the jumper.\*2

Heart rate monitoring is another method of technology which is being used to help improve sporting performance. Heart rate monitoring would be useful for long-distance runners, this is because these athletes will have to make sure they're working in the correct zone so they don't over or under perform. And if they do find themselves coming out of that target zone, then they know that they'll need to get back up. Contrastingly, if a runner falls out

of their target zone then it could be an indication to the coach that their cardiovascular fitness isn't where it should be, so training would have to be provided for this.

Lastly GPS monitoring in elite level rugby players is becoming more evident. The GPS monitoring tracks how much distance a rugby player has travelled, where they have been on the pitch and their speeds. All of this is beneficial for a coach to see as if they see a forward is walking around the pitch not covering much ground then the coach can ask why this was happening and rectify his mistake. All of this can be improved and when it is improved it is extremely useful for the coach to use.

In conclusion, the use of technology is extremely useful for coaches and players as it allows for them to see where a player is going wrong and can lead to an intervention from the coach.

\* Once they have done this then the cyclist will be more efficient at their sport and will be able to get better times in races.

\* If the coach can see there is a need to improve

the power then a jumper will be able to push themselves further when it comes to competing. When more power is generated on the run up, the further the athlete will travel.

\*3 and once training has been provided for the athlete, the coach and athlete should be able to see the benefits of the training which will motivate the performer further.

\*4 It is imperative a ~~performer~~ forward gets to every breakdown so that they can retain possession or fight for it back, and if a forward is being lazy then the coach will have to do something about it.



**ResultsPlus**

**Examiner Comments**

This essay is a classic band 2 essay. It has lots of relevant information on ways of refining performance, although some are irrelevant, but it does not show both sides of the argument so limits the score to band 2. There is no negative side shown.

\*6 Discuss the use of technology to refine a performer's technique and its impact on their sporting performance.

(20)

- Plan: Intro → ~~perfect~~ efficiency & video
- ✓ ① → compare to perfect model, take out errors from coaches observations.  
eg in depth statistics → e.g. Hawkman, Prozone
  - x ① → not everyone the same, may overcomplicate things.  
(Michael Johnson, Jim Frye)
  - ✓ ② → improvement in equipment can help. ↑ efficiency
  - x ② → lost of everything
- conc → ↓ help ↑ efficiency & reliability, less so complicated & costly.
- Lonnie Amsharov  
↑ Sports Science,  
Wind tunnel*

It is essential for elite performers to refine their technique. Practising a bad technique can waste energy and introduce bad habits. Therefore, having a good technique will increase the efficiency of movements, meaning they will have a greater impact on performance with less energy and greater energy conservation. Technology has recently played a very large role in assisting the refinement of technique.

Firstly, video evidence allows players to analyze their technique. This can be beneficial as they do not need to rely on <sup>their</sup> coaches observation, which relies on the coaches knowledge of the perfect model and their ability to see any minor errors. One major benefit of video analysis is that it allows the performer to compare their technique to the perfect model. Thus, they can easily identify areas for improvement and so increase the efficiency of their technique in order to get closer to the perfect model, meaning their performance



will also increase as a result. Furthermore, technology has also allowed for the use of in-depth statistics and analysis. A good example of this is ProZone for football or TrackMan for golf. ProZone has the ability to capture each movement a footballer makes during a match or a training session. Therefore, the coach and player can see ~~the~~ their position on the field, where they made touches, how many passes / successful passes were made and how many shots / shots on target etc. Therefore, it is easy for coaches to identify possible areas of weakness and it is also easy for players to see them. Thus, by training these areas rather than others that may not need it, their technique will improve and thus so will their performance. TrackMan is used by a number of ~~p~~ successful golf players, such as Dustin Johnson who has his own. TrackMan not only provides video evidence, but also in depth statistics such as distance, direction and angle of attack on each shot hit by the performer. Therefore, the statistics can display a bad shot and the coach and player can identify what caused it by also looking at the video evidence. Thus, technological aids such as ProZone, TrackMan and video analysis have made it easier to spot errors and so training has become more efficient, meaning sporting performance will also improve, ~~and~~ ~~therefore~~

However, there are also limitations to the use of technology to refine technique. Firstly, although there is a widely accepted, correct method of techniques in each sport (perfect models), there

are also exceptions. For example, Michael Johnson's Sprinting technique was not 'technically' perfect according to the perfect model and yet he was one of the greatest Sprinters ever. Jim Furyk's golf swing is far different to what is seen as 'the perfect golf swing', yet he has made over \$80 ~~the~~ million dollars in earnings during his career as a professional golfer. Thus, there are many variations of the perfect model and getting caught up in trying to produce the perfect technique will reduce the individuality of a performer. It could also lead to a decrease in performance due to constantly trying to make technical adjustments. Another limitation of technology is that it may over-complicate things. For example, statistics may show that a player only had 3 shots on target in a match, which suggests that their shooting technique is weak. However, it may not show that it was because the defenders were too good. Therefore, it is not practical. Also, a coach may spend entire training sessions bombarding players with statistics and tactics to improve technique that they may be losing out on time to actually be working on technique. Finally, technology can be extremely expensive and so not available to everyone. For example, Lense Armstrong offers training in a wind tunnel in order to find minor areas to improve technique using sports science in order to improve performance. However, the cost of all this equipment is only available to those at the very top. Also, a TrackMan system costs \$10,000, therefore it is also only available to the very few, which can make it hard for others to achieve the perfect technique.

In conclusion, I believe that technology has increased both the players' and the coaches' understanding of technique and it has also allowed them to develop more efficient training sessions that will refine technique in order to improve sporting performance. However, I believe that it will only truly be beneficial to sporting performance if it is used in moderation. Over-use can actually inhibit the ability of an athlete to refine their technique and thus, may actually decrease sporting performance.



**ResultsPlus**  
Examiner Comments

This essay is a good example of a top band essay including full detail and a good structure with both sides of the discussion

\*6 Discuss the use of technology to refine a performer's technique and its impact on their sporting performance.

(20)

Technology

Perfect model, Prozone, datahub, Biomechanics, Worn, money

Technology can be used to refine a performer's technique in many different ways and with the development of technology in recent years it's becoming more advantageous. For example an athlete could use video analysis to analyse their technique and see how they can make any improvements to make their technique more efficient. For example golfers such as Jason Day from Australia can set up a camera to record their swing and this is better than observational feedback because it enables the athlete to see the swing themselves that can make it easier to understand where they're needing to improve so it becomes more likely for them to successfully adjust their swing, which can allow them to improve performance through longer distances but, accuracy & can also reduce the risk of injury. Following on from this use of video analysis you can use photographic analysis too that similarly allows the athlete to see their technique and how to improve. Although video analysis has been improved in recent years through the addition of computer software, like ~~software~~ <sup>analysis</sup> that allows biomechanical analysis of the components involved in a technique in order to improve, for example it could show how a footballer could run with a different angle in the abduction of their legs to prevent injury and be more force, so allows more detail that could have been absent in just video analysis alone, furthermore

It allows you to compare a specific technique to the perfect model, which is 'The recognised way of performing a skill or technique.' This allows you to see similarities & differences that could help and hinder performance, that would allow the athlete to adjust and hence a better performance because of these changes. Video Analysis & Computer Software that allow this in-depth analysis is far improved version of observational feedback, where a coach would observe the performer doing the skill and try to analyse and feedback how to improve, which was not very accurate, is under the assumption the coach understands what the skill should look like in terms of the perfect model and can coherently relay the information to the performer, for them to implement the changes.

Another piece of computer software is Prozone, this is where there are 12 sensors around a pitch with the performer wearing sensors, and second by second statistics are relayed to a computer. This information can tell us the statistics of their performance, like distance covered, sprints made and also the tactical element of positioning and runs, this allows the coaches to determine the factors to which they're having on the game, this can aid the use of rotational analysis which is primarily concerned with statistics and strategy. This then allows the performer to refine their technique through the feedback given, and they can adjust their positioning, distance covered etc to be more effective.

Technology also plays a large role in the 'tec' clothing that an athlete can wear, and something like compression clothing can help refine performance - it allows a more aerodynamic figure to be present that reduces drag so can help lower time on races, also can meanwhile

increase power output by up to 27% and reduce risk of injury through a constant blood flow and reduced muscle vibration.

To conclude technology can greatly help athletes to refine performance through the use of analysis and advance readings allowing them to refine their technique to create better outcome of each skill. Although this technology can be very expensive, with computer software like motion costing up to £12,000 a year, this then forces the idea that not everyone can afford this technology, so in football it rich clubs like Manchester City can afford to use this technology to improve, but they play a low-league side like Wimbledon, it makes us think it has to fair and should they be allowed to have this advantage. And it could be said that it is preventing purely natural talent from dominating.

Performance analysis with the combination of ~~then~~ rotational analysis and biomechanics to work out how movements affect performance this can be used to refine technique by analysing and figuring how to influence the performance more to create better outcomes, like in rugby it may be the angle of the extending arm when passing could be slightly adjusted to make it more accurate/greater distance which can have a greater impact on the impact of the game.

Furthermore the technology used to refine an athlete's performance is becoming more important because of the reward for winning, but ~~that~~ improving by 1% could be the margin between winning and losing, and with the victory, comes large reward prize, contracts,

Sponsorships and there's pressure to win from the media, fans etc. This means the importance of rehab technique is crucial, even as a method of injury prevention, so they can carry on competing because of adjustments made to allow less stress or damage to specific muscles or joints.



**ResultsPlus**  
Examiner Comments

This response scored 15 marks

\*6 Discuss the use of technology to refine a performer's technique and its impact on their sporting performance.

(20)

Today there are vast amounts of technology that can be used to refine a performer's technique. These technological advances have a huge impact on sports performance and have led to records being 'smashed'. However has it gone too far and is it becoming increasingly unfair as poorer countries cannot afford these technologies? In this essay I will look at the different technologies that can be used such as programmes. For example, prozone and dartfish. I will look at their impact on a sports player, the team and its impact on a country as a whole. I will involve case studies such as Andy Hine who played polo for England and was captain for many years and how he used dartfish to improve his technique. I will then look at the disadvantages using the case study of Johnny Barstern who plays cricket for England and has recently got the highest amount of runs consecutively in a test match.

The first form of technology I would like to look at is Dartfish. Dartfish is a type of software programme that can be used to look at and evaluate a performer's technique. Dartfish enables a coach to record, play back, pause, ~~advance~~ and many other features. The main one is the ability to compare video footage



with other footage by other elite sports performers. An E regd polo player Andy Hine had been playing polo for many years he got up to 3 goals however could not get any further. He decided to get David Jack and his coach (Cumbrian) filmed him taking a shot (off side fore hand) and then compared it to elite sports performers, the best polo players in the world (Polish Poles). They found that Andy was hitting the ball like with his head too far down consistently. As a result Andy changed his technique through practice which was recorded. Then cameras would be down on to see exactly where Andy was hitting the ball and where his head was. Once this had changed and his technique improved in the years to come. He became the highest breaking player in England at 7 goals.

There are clear advantages of this sort of analysis. However, there are also some disadvantages. Due to the changes in Andy's technique he was unable to play in the Queens cup for Tacana (the team he manages today). This was a set back for the team and he also lost his place in that team and had to play for el renensso.

~~Another impact of tache~~

However, overall Andy benefited hugely from the use

of Don Fish as it refined his technique and he was able to excel as a player as a result. Thus it had a positive impact on his sporting performance.

To contradict this Johnny Birston, an English cricket player. When Johnny first joined English cricket they tried to change his technique so much that he was not himself all he was worried about was trying to keep his form this was too much and he could not make any sense. Last week in an interview they compared him if Johnny was (his technique) when he first joined to the present day and it is completely different. He now has his own style of play and is completely relaxed, not having to worry about his form and what he should be doing he said 'I was so worried about where I should be standing where I should hold the bat, that's all I could think about' compared to when he described the present day; 'I just try and hit the ball now'. This shows that evaluating technique is not always the right thing to do for a sports performer. This had a negative impact on his sporting performance.

Force plates are another form of technology. They are mainly used in golf to assess the weight distribution on each foot. This has helped many golfers from their woods to Edward Snyders. I can refine all types of players technique.

In conclusion I believe that technologies have had an overall positive impact on athletes sporting performance. As I have shown in this essay through the case study of the England polo captain the use of technology in refining techniques can have hugely positive impacts on sporting performance.



**ResultsPlus**  
Examiner Comments

This response scored 15 marks

\*6 Discuss the use of technology to refine a performer's technique and its impact on their sporting performance.

(20)

Athletes and performers all aim to refine their technique to be more like the perfect model. This is the known and accepted way of performing a particular skill that allows for optimum biomechanical efficiency.

The most commonly used piece of technology to do this in particular is video software programme called Dartfish. Here is when they see themselves directly compared to the perfect model so they are able to highlight specifically what needs to be improved. This is good because they are able to physically see it for themselves and then make active changes to adapt this.

In some ways technology is good to refine technique because they are given the best possible chance of improving their performance. Technology is very up to date and recent so having the best technology can help beat competition. As especially as in modern day sport the difference between first and fourth for example is so slim that technological advances can help you in gaining a competitive advantage and therefore improve your chances of medal placing potential. As well as this technology also helps to improve and refine your technique in preparation for different conditions. For example wind tunnels for cyclists help you to maintain aerodynamics in windy conditions. If these conditions were to occur on the day of the competition, optimum

preparation would have been done to help maintain and improve sporting performance. Overall the rise in technology in sport has helped to improve sporting performance as a whole all over the world and therefore making it more competitive.

However although the use of technology can help a performer to refine techniques such as a cricket bowl or netball shot the extent that this will then impact overall performance depends on how well it is rehearsed and put into the long term memory. This is important as it takes a lot for an athlete to come out of one habit and transfer to be doing something else. This is what makes the action automatic and therefore improve performance. This is especially true for the small changes and particular skills that are relevant for refinement of technique.

As well as this technology can also be seen to ~~make~~ completely change the technique of someone ~~that~~ where a different technique may be working. For example Paula Radcliffe's running style doesn't fit in with the perfect model, yet her technique seems to work, as seen by the amount of high successes that she has had. This shows that not everyone fits in with ~~with~~ the perfect model and if their technique is working for them, is it ethical to change their efficiency ~~to~~ to become more like the perfect model? This would depend on if there is anything in particular that makes them less efficient

and therefore slight changes may help them improve.

But even then, they won't look like the perfect model, showing that probably because of the different shapes and sizes of each individual athlete, each individual would have a technique that is perfect for them and should improve that, rather than aspiring to be the perfect model.

As well as this the use of technology can be seen to take away the natural talent of athletes. For example refining technique of an athlete may change them so much that they are nothing like they before. This isn't seen as a good thing because it can be an unfair advantage over competitors.

Overall the use of technology does help to refine technique which in theory should increase efficiency and improve performance. But whether it should be used is questionable because it can be seen as unfair. In the future this will get worse as technological advances improve, so will have to be careful about where the line between what is okay and what is cheating is drawn.



**ResultsPlus**  
Examiner Comments

This response scored 15 marks

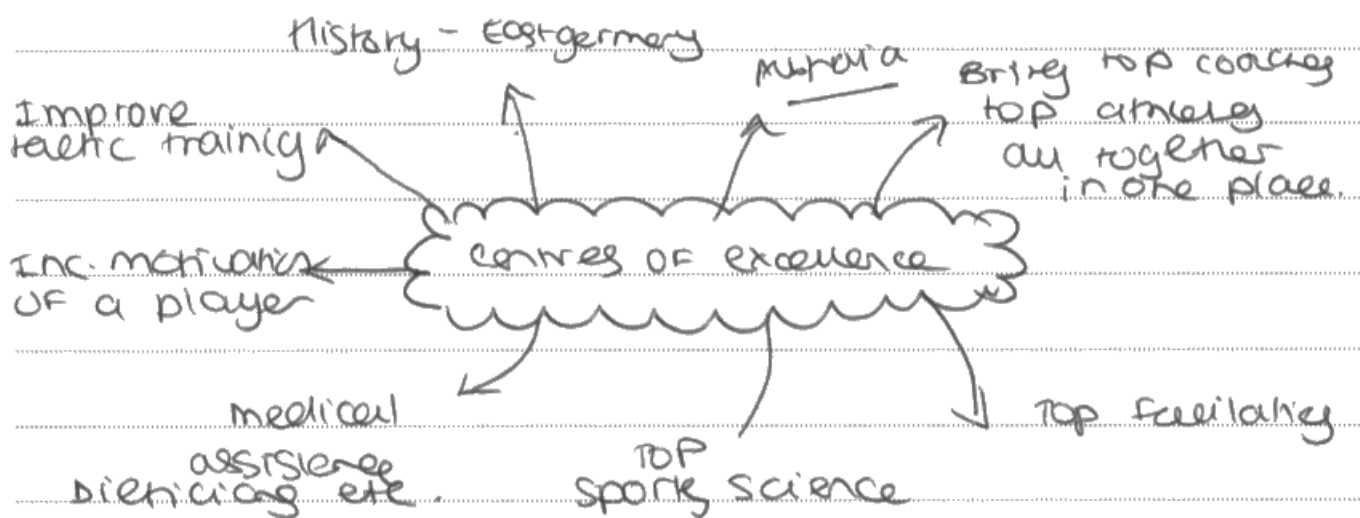
## Question 7

This essay did not score as highly as the other essay on the paper. The most able were able to focus their question on how centres of excellence enhanced performance. Those candidates who noticed that the question wanted them to focus on how centres of excellence enhance performance moved up to band three. Many candidates got too bogged down in Australia, Germany, UK and USA systems without referring back to the question itself and using what felt like a preplanned essay on all four countries studied. It was like they were answering a previous exam question and not having read this one very carefully. Very few students provided a counter argument – the most popular counter arguments used were about cost and unfairness to poorer nations. Better responses included information on athletes moving away from home, how different systems may miss potential talent, the fact that having best coaches and facilities in one place allows the best athletes to train and compete together.

When preparing candidates for exams make sure that they are answering the actual question on the paper, underlining key words, not spotting the words technology (in essay 6) or history and development (in essay 7) and heading off on a tangent.

\*7 Discuss how centres of excellence can be used to enhance optimum sports performance. Refer to the history and development of elite sport in your response.

(20)



When it comes to elite athletes and teams centres of excellence can become a focal point for their preparation for major competitions such as the Olympics.

As from the name centres of excellence provide the top class facilities, with the best

equipment possible for training, ~~the~~ example  
of ~~the~~ <sup>the</sup> best gymnastics equipment and gym  
equipment. They also have the best medical  
team which would include dieticians, physio-  
therapist, sports psychologist and also the top  
coaches of the sport in one place. This means  
athletes can work on and develop all aspects  
of their performance which is needed to achieve  
optimum performance. As with this, centres of  
excellence is where the government put money  
into sports science development so elite  
athletes have availability to the most  
modern sports science which could be the  
reason for the achieving optimum sports  
performance.

An example of a centre of excellence is the  
Northern Ireland Sports Institute of Sport  
otherwise known as 'SINI'. It is based  
in the University of Jordanstown. Athletes  
who are successful in their sport and are  
preparing for global competitions would have  
access ~~from~~ <sup>to</sup> SINI, SINI and all its facilities.  
An advantage of having a centre of  
excellence would be that it brings all the  
top coaches and athletes in the country  
together in one place. This means the  
coaches can bring together all their best



training advice and tactics, which will help to provide an optimum sports performance. Also the top athletes being together and seeing what <sup>each others</sup> ~~their~~ competition is or what ~~their~~ other athletes are like can motivate them a lot if they see other athletes better than them.

For team sports such as rugby centres of excellence can be brilliant for national squads. For example the Irish Rugby Squad. As well as having the best available facilities and sport science to develop physiologically. It also gives them a chance to bond as a team and form friendships.

AS a closer knit team will perform better during matches if they know each other well so therefore <sup>enhancing</sup> ~~improving~~ optimum performance.

Centres of excellence began with East Germany, ~~or~~ they began the system of developing their athletes <sup>to the</sup> ~~to the~~ optimum level for global games to use the global games as a shopwindow to show their government was a success. They developed sports specific boarding schools and centres of excellence where the government put money into developing ~~top~~ top class facilities and payed top class coaching.

Australia adapted this method of centres of excellence after a devastating Montreal Olympics where they won no gold medals. They too developed centres of excellence. There may be disadvantages to centres of excellence. As there may only be one in a country for example there is only one in Northern Ireland, ~~practises~~<sup>athletes</sup> may have to travel far distances or in most cases stay far away from home and their families to train. They may get home sick and therefore psychologically performance would drop.

Also people may say all the money from the government is going into the top of the pyramid into the elite system and very little going into develop the bottom of the period and the fundamental stage.

Fundamental stage or the bottom of the pyramid ~~means~~ is very important as without it you wouldn't have a top part.

To conclude I think centres of excellence are key in enhancing optimum sports performance. It provides elite athletes with the best facilities, coaches and medical assistance available and essentially <sup>what</sup> they need for competing in global competitions where the margin between

winning and losing are so small and to  
achieve their goal of success.



**ResultsPlus**  
**Examiner Comments**

This essay answers the question about how centres of excellence enhance performance and therefore is worthy of marks in band 3.

\*7 Discuss how centres of excellence can be used to enhance optimum sports performance. Refer to the history and development of elite sport in your response.

(20)

Centres of excellence are essential to providing optimal sports performance. As time has progressed, the idea of centres of excellence has increased with different ~~ideas~~ ideas and variations of the centre of excellence system. It can help to pool the best resources, facilities and coaches helping to provide the best potential for development. It also pools the best athletes and competition to be the best can help drive and motivate performers to train harder and become better.

The East German model was ~~the~~ the first country to develop the centres of excellence approach. They had a comprehensive talent identification system at primary schools and they developed many athletes to reach this centre of excellence. This centre of excellence was equipped with state of the art facilities, the best coaches, the best sports science in nutritionists and biomechanics. This pooling of resources along with intense training competition between athletes gave them the best chance of success and potential to development. If an athlete is given all the criteria to develop, ~~and~~ become they can cause a much ~~great~~ improved performance. In the 1976 Olympics, East of Germany finished second, even though they had a small population of around 16 million, so by improving the facilities and having a holistic

approach to athletes development, optimum sports performance will occur.

However, centres of excellence ~~can~~ <sup>can</sup> have issues, ~~especially~~ especially when state run in the East German case they can easily hide ~~and~~ <sup>illegal</sup> methods of doping or drugs, as the state runs the centre and funds it, it is all kept inside, so the fact people are taking illegal performance enhancing drugs such as EPO or anabolic steroids can be hidden. ~~The health effects~~ They are causing the game to ~~become into~~ <sup>become</sup> ~~distort~~ <sup>distort</sup> ethics to be taken away but also very detrimental to health, which can cause a decrease in performance in the short ~~term~~ term.

The Australian Institute of Sport ~~at Sport~~ is another example of centres of excellence which is state funded. It was set up in 1981 ~~to~~ as result of a poor ~~at~~ 1976 montreal olympics and the results were staggering, picking up 27 gold medals in Barcelona in 1992. It was initially set up in Canberra but in 1991 moved to create many centres of excellence in all major cities. with the original location in Canberra, they found athletes didn't like moving away from home to live and train in the same location, so by having many centres of excellence, athletes can live at home and ~~and~~ still have facilities, support and coaching pooled into one area, ~~this helps to~~ This enables development and have all the necessary support and facilities to train, whilst being happy and comfortable at home,

decreasing the ~~psychological~~ psychological factors causing reduced development. Athletes therefore develop faster and into better players helping to achieve optimum performance, whilst negating the issues usually associated with centres of excellence such as homesickness.

Another ~~first~~ example is ~~the~~ in the United Kingdom, with the United Kingdom Sport Institutes. There are many Sport Institutes around the UK such as Bedford, Loughborough and Leeds. It is not a state funded program, private investment from the national lottery funds this scheme. Again, based on the East German model of pooling of resources, these institutes have world class facilities, coaches and support. This allows ~~the~~ the world class ~~performance~~ class performance pathway to be initiated, from identifying world class talent who have potential, to ~~then~~ developing them to ~~the~~ the world class podium ~~where they~~ where they have the potential to win medals. By having these institutes, competition between athletes occur, driving motivation to improve. As it is not state funded, it becomes hard to fund and is a mixture between the centralised and decentralised approach, meaning that it can be hard to fund the personal lives of performers. This results in money worries and a concentration from optimum sports performance is taken away, meaning reduced performance.

The USA is a final example of how Centre of Excellence doesn't necessarily result in enhanced performance. The USA is different in that high schools and colleges act like the club system in the UK, they have access to high quality coaching and facilities helping them develop, while large crowds help them prepare for the pressure of elite sports.

It has been shown that for small populations such as East Germany and Australia, the Centre of Excellence system is successful in enhancing sports performance. However in large highly populated countries such as the USA, Centre of Excellence isn't an option because it would be too costly for state funding so the high school system using private funding and sponsorship is more successful in creating high quality facilities and support.

Overall, the Centre of Excellence system without a doubt enhances optimum sports performance. East Germany's original model has been adapted to enable the ability of performers to be fully exploited and reach their optimal sports performance. The development of this model will continue to ensure pooling of support, facilities and performers to enable even higher levels of optimum sports performance.



**ResultsPlus**

**Examiner Comments**

This essay is a top band 3 and really focusses on the question given with some counter argument

\*7 Discuss how centres of excellence can be used to enhance optimum sports performance. Refer to the history and development of elite sport in your response. (20)

East Germany → Australia → UK

State plan 1423 doors

Top facilities, Coaches, medical staff, 10 young

Centre excellence  
Borisy - academic  
had an  
net

All Programme Support

hub = sport all together group cohesion

Centres of excellence have been used throughout history to enhance and develop sports performance. East Germany, Australia and the UK have all incorporated centres of excellence in their programmes to develop elite performance.

A centre of excellence is a sports hub which has top class facilities, top coaches and medical staff, nutritionists, physiologists etc. All have access to each other or elite sport to provide best environment to enhance their sporting ability.

Open Centres of excellence started in East Germany where if you had been identified as have talent and potential you went to a sports college which was housed a boarding school which contained top facilities, coaches, medical staff, technology etc. This allowed performance to be improved as all elite athletes were in one centre and meant that there was a large support network in place for the athletes. These centres had top technology such as Endless pools, sport treadmills and hypoxic chambers enabling their techniques to be refined giving an advantage over competitors but also the ability to train and complete academic studies, meaning that performance improved not decreased. East Germany also used systematic doping in these centres of excellence State plan 1425 allowing more



adaptations to ours to ensure success and further enhance their performance.

Australia adapted its system of elite sport development from the East German model as it saw good qualities in it. Australia like East Germany created a centralised system of elite development with one central hub. In Australia the AIS (Australian Institute of Sport) ~~was created~~ was created in 1981. This included top coaches, medical staff, technology etc. similar to sport colleges in East Germany. Allowing sports performance to be improved greatly at the same ensuring success. Talent was identified young and men ~~encourage~~ encourage to join clubs if they still showed potential after a few years invited to AIS to train to compete nationally. Australia didn't use doping like East Germany did but ~~kept~~ kept a clean and legal system of sports development.

~~The UK adapted the Australian~~

The UK further developed his elite system from Australia and opened 4 Institutes of Sport in each of the countries that make up the UK, England, Scotland, Wales and Northern Ireland. The English ~~institute~~ Institute of Sport, EIS, had many sporting hubs where it was more dedicated to a specific sport e.g. Loughborough swimming and athletics and Bisham Abbey Hockey. These hubs have top class facilities, coaches, medical staff and technology again helping to improve elite development here and more efficiently. The UK adapted the East German and Australian, centralised systems into a decentralised system which allow each sport to focus on their athletes only e.g. Bisham Abbey only deals with hockey players not swimmers. Allowing more time and effort to be put into each perform and train and allow specialised equipment and technology to be made and used for the athletes at these centres. And allowing group cohesion to occur between athletes improving.

Social ties and creating a support network.

Centres of excellence do help sports athletes improve but can hinder progress as if the athlete needs to move to go to a centre it can affect their ~~the~~ psychology and often negatively on their performance as they will be less focused and motivated to do well at these centres.

However to cancel out centres of excellence do enhance performance due to facilities and staff inside. Even though some athletes can feel intimidated the support network of athletes and staff helps to reassure and ensure that athletes are comfortable and prepared to train in a new environment.



**ResultsPlus**  
Examiner Comments

This response scored 14 marks

\*7 Discuss how centres of excellence can be used to enhance optimum sports performance. Refer to the history and development of elite sport in your response.

(20)

The East German model of ~~elite~~ centralised elite sport can be seen as the prime ~~and~~ and first example of centres of excellence being used in full effect in order to enhance sporting performance. In ~~the~~ East Germany in the late 1970s - 1980s ~~and even~~ the centralised system meant that all sport was state funded and controlled, ~~and this~~ and under communist rule this resulted in large amounts of money being spent on sport in order to facilitate the 'shop window' effect of the communist system. Therefore in East Germany there would be one or two 'centres of excellence' where all the best athletes in the country would go to, to train together, ~~and~~ with the best state of the art facilities and with the best coaches in an attempt to ~~the~~ maximise sporting performance. Due to the fact that the top athletes would train alongside one another this meant that levels of competition between athletes were very high, therefore boosting sports performance. In addition performers

would have a round the clock nutrition plan which they had to follow and would also be constantly tested and subsequently monitored in terms of progress of their performance levels. ~~This~~ This system, in effect, led to East Germany, such a small nation on the international stage generating ~~so~~ so many Olympic victories. However this can also be down to the fact that due to such high expectations, ~~the~~ scientists would constantly have to find the best 'medicine' to improve the athletes, which led to the systematic doping of all East German athletes, therefore their success can be put down to the centres of excellence with the best coaches, facilities and high levels of ~~some~~ inter-performer competition, however ~~it could also be down~~ this was undoubtedly boosted by the use of anabolic steroids and doping of all athletes, gaining an unfair advantage over their competitors.

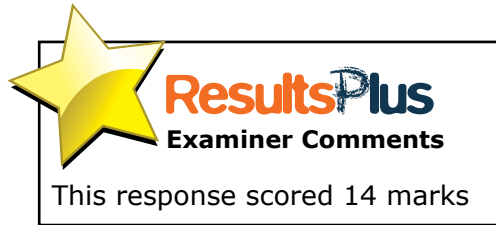
~~the~~ However, ~~a~~ for more recent ~~the~~ centralised model of sport ~~was~~ was the Australian, 'Australian Institute of Sport' model which was set up due to an extremely

poor performance at the 1979 world Championships where Australia only managed to gain 4 bronze and 2 silver medals. ~~Also~~ Also due to popular demand following this embarrassment <sup>govt spending increased on sport, and</sup> the first AIS centre of excellence was set up in Canberra, ~~and~~ which, similar to East German centres of excellence, housed and boarded the best ~~at the~~ Australian athletes from across the country under one roof, along with professional coaches, top sports scientists, nutritionists and along with the best ~~of~~ training and performing facilities with state of the art equipment. This system was proven to be a success in the 2000 Sydney Olympics where the Australians ~~reaped~~ ~~the medal tables~~ ~~showing~~ gained vast amounts of medals, including 14 golds, 23 silvers and 14 bronze, showing a vast improvement in sporting performance in comparison to the previous embarrassing performance. However this system in Australia was subsequently decentralised as only having one centre of excellence, in Canberra proved a problem as performers found it difficult to

travel ~~to~~ sometimes extreme distances to train, therefore they now adopted in the AIS, many centres of excellence, one based in each of the main countries/districts in Australia making it far easier for elite performers to reach a centre of excellence. Australia are still very successful in sport.

In conclusion, the implementation of centres of excellence have ~~to~~ and are used in order to optimise sports performance in elite sport. Two prime examples are the East German and Australian ~~and~~ centralised models where ~~the~~ the top athletes would train and sleep under one roof with the best facilities, equipment, coaches, sports scientists and nutritionists. These two models proved that through the use of centres of excellence sports performance can be optimised. However the flaw of this system is that grassroots and intermediate level sport receives very little attention and funding, highlighting the elitist nature of this system. ~~It~~

(Total for Question 7 = 20 marks)



This response scored 14 marks

\*7 <sup>→ move away</sup> Discuss how centres of excellence can be used to enhance optimum sports <sup>→ money</sup> performance. Refer to the history and development of elite sport in your response. (20)

Plan: Australia, UKSI, East Germany, Sport science, coaches, national institutes, biomechanics, funding, scholarships.

Centres of excellence are hubs and venues that have world class facilities and coaches in one location across a country, which leads to an improved performance.

The first country to develop centres of excellence was East Germany. This was because after the most talented athletes were found through screening at primary schools and went to boarding schools, they would be located at a centre of excellence. This resulted in an improvement of performance as the German's had access to <sup>the first</sup> sport science technology such as academies and hypoxic chambers. Also, centres of excellence gave the athletes access to world class coaching and train with athletes of the same ability so their optimum performance would improve. For example the hypoxic chambers allowed athletes to receive the benefits of altitude training without leaving the country. However the East German model for centres of excellence has its faults as the highly



centralised model meant the athletes were dragged under State Plan 1423. <sup>And athletes were forced to move away from home which reduced their mental performance.</sup>

Australia copied the East ~~the next country~~ to German model in 1981

when the AIS was opened. This was due to the failure at the Montreal 1976 Olympics.

The AIS (Australian Institute of Sport) provides facilities for 35 sports. Centres of excellence enhance optimum performance as they provide sport science specialists. For example Australian long jumpers

are based at the AIS and biomechanists track their movement and force to improve technique. The centre of excellence also provides accommodation so brings together the top athletes so they can live and train together. However this

could decrease performance if athletes have to move away from home and are not used to their surroundings. Centres of excellence also cost large amounts of money so can create an elitist approach like America as funding is taken from grass roots. But there are many satellite centres of excellence in Australia now.

as there is one in every <sup>state</sup> <sup>no not all athletes would have to move</sup>. Furthermore centres of excellence enhance performance by nutritionists and psychologists being available. This means all aspects of the athletes life is maintained to result in the best performance.

For example the nutritionist can ~~lead~~ <sup>lead</sup> to weight management and control the athletes diet so they are consuming the correct energy sources. <sup>As in the 1992 olympics Australia got 27 medals which shows centres of excellence are effective at enhancing performance.</sup>

In the UK there are a range of centres of excellence around the country they are run by UKSI and no matter where you are in England you are only 2 hours away from a centre of excellence. For example Loughborough University in the Midlands for cricket and St George's Park for football.

In the UK scholarships / <sup>funding</sup> ~~are~~ <sup>are</sup> offered <sup>up to £30,000</sup> to the most talented athletes to train at the centres of excellence and become a full time athlete. This will enhance performance as they can train full time due to them having an income. The centres of excellence enhance performance as research and development occurs there. For example wind tunnels are used at Bath University to make track cycling bikes more streamlined and reduce drag. Furthermore, centres of excellence bring the best coaches together. This means performance will improve as athletes will have access to the newest and most

effective training methods and also an insight to the best knowledge from coaches and previous athletes. ✱

However this is compared to the American system, who's decentralised model does not have centre of excellence. This is due to private funding and world class facilities in high schools and colleges. ~~Therefore this shows~~ The ACF programme provides them with up to 100

Overall, I believe centres of excellence enhance sports performance as they provide world class facilities in a sporting environment.

This means when they go to train they are fully focused on training and performing.

However they can create unfairness in the sport as not all countries can fund centres of excellence and not all athletes have access to the newest sport science technology.

This creates the nature of sport to be who has the most money rather than who is the most talented. Also athletes may have to move away from home which can increase anxiety.



**ResultsPlus**  
Examiner Comments

This response scored 14 marks

## **Paper Summary**

Based on their performance on this paper, candidates are offered the following advice:

- To read the essay questions very carefully and to ensure they answer the question asked and not a pre-prepared response
- To learn definitions of key words
- To ensure in a 'discuss' question that counter arguments are used
- To make linked points in an 'explain' question
- To support points made in questions with contemporary examples from an appropriate activity to support the point being made
- To check that they make enough points to at least match the number of marks available
- To try not to attach additional sheets to the paper

## **Grade Boundaries**

Grade boundaries for this, and all other papers, can be found on the website on this link:

<http://www.edexcel.com/iwantto/Pages/grade-boundaries.aspx>

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