





A LEVEL PHYSICAL EDUCATION - 7582

ROLE OF TECHNOLOGY IN SPORT



LEARNING OBJECTIVES

To describe the functions of sports analytics.

To understand how the development of equipment and facilities impact on participation and performance.

To explain how technology in sport has positive and negative effects on the performer, coach, audience and the sport.

THE ROLE TECHNOLOGY IN SPORT



Technology in Sport - Is it cheating?

FUNCTIONS OF SPORTS ANALYTICS

The world of sport is continually changing over the years, and the use of technology and analytics is one of the fastest growing in modern day sport.



Think. Pair. Share – What technology and analytics changes have been seen in sport in the last 5 years?

FUNCTIONS OF SPORTS ANALYTICS

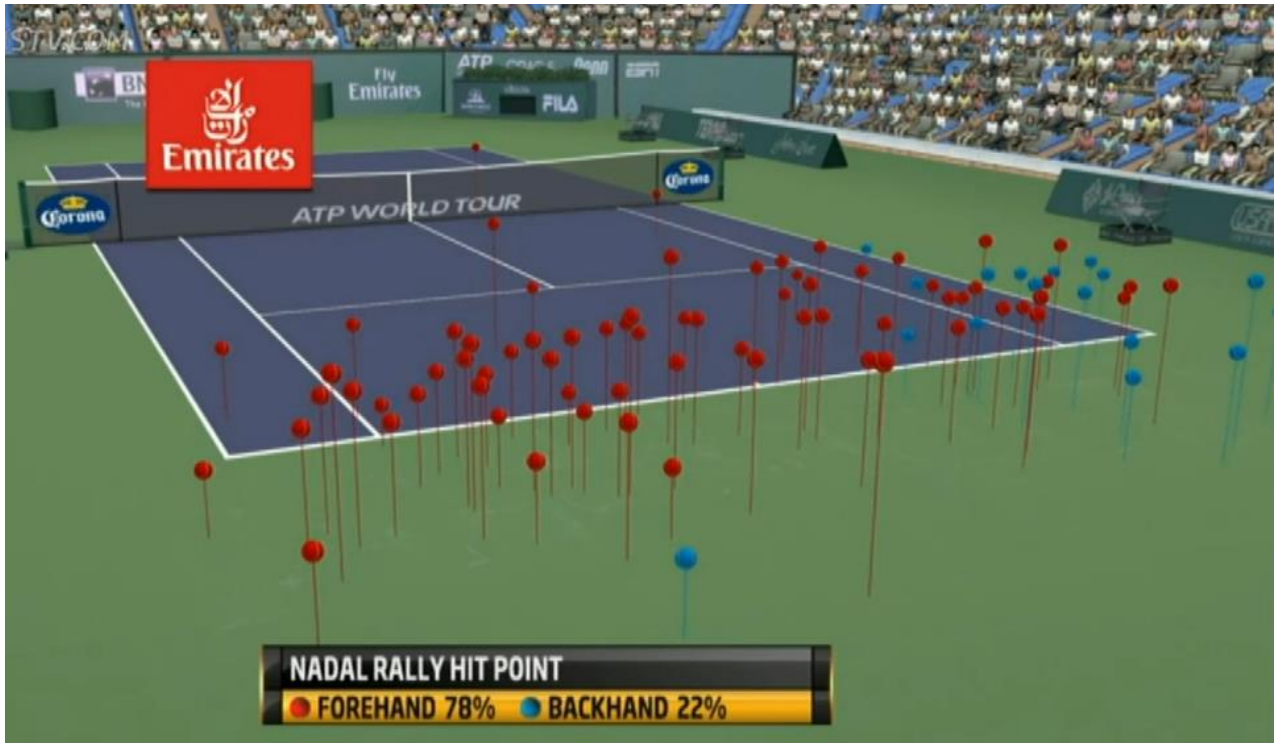


Watch me

How have basketball team used sports analytics?

FUNCTIONS OF SPORTS ANALYTICS

Sports analytics is the collection of relevant, historical, statistics that can provide a competitive advantage to a team or individual.



As technology has advanced over the last number of years data collection has become more in-depth and can be conducted with relative ease.

MONITORING FITNESS FOR PERFORMANCE

Monitoring of fitness:
Exercise intensity and heart rates are now key data used by professional clubs to monitor the effectiveness of training and recovery.



Think. Pair. Share – What data might a professional club want to obtain from their players?

MONITORING FITNESS FOR PERFORMANCE

Analysing data and assessing fitness is common practice at professional level but is more popular at lower levels of performance too.

Heart rate monitors and advancement in watch capacities have led to the general public taking a larger interest in fitness and activity levels.



SKILL AND TECHNIQUE DEVELOPMENT

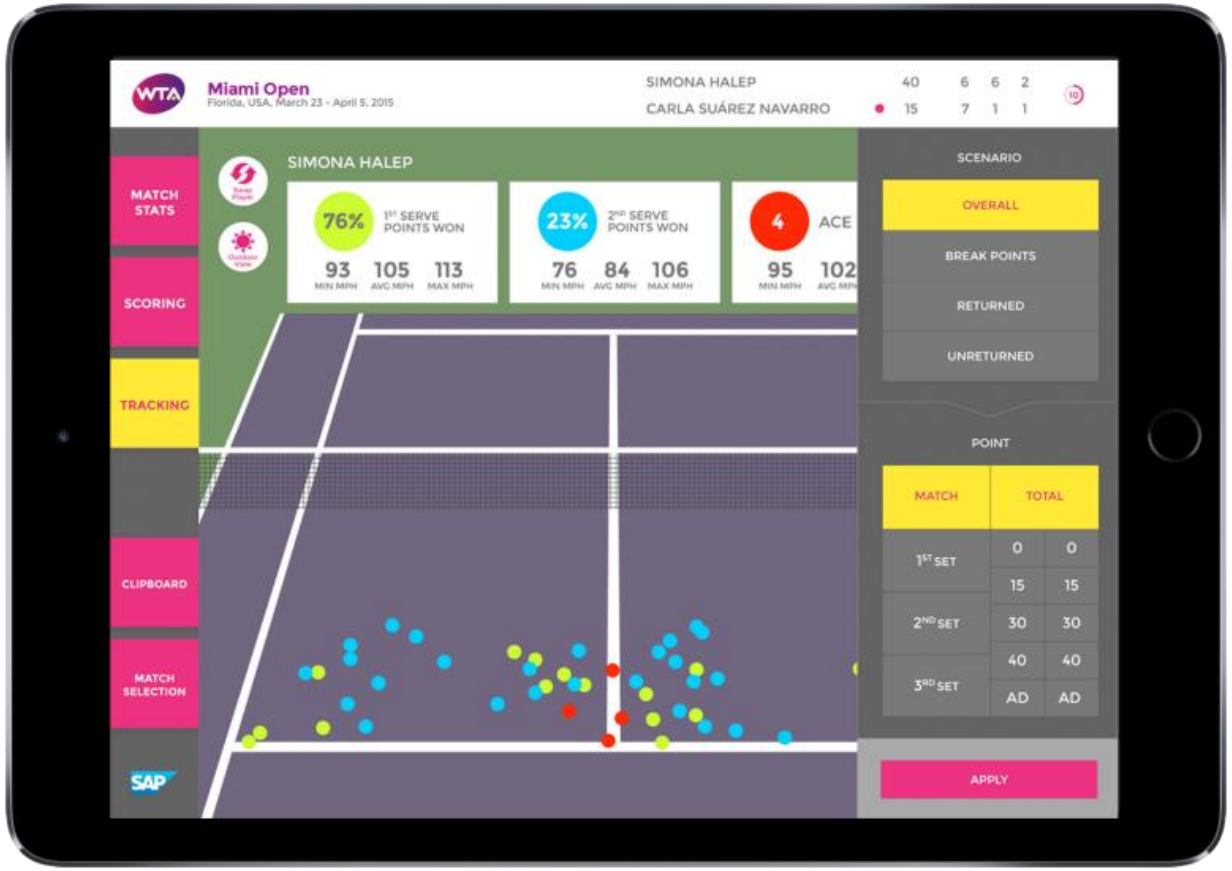
Video analysis programs combine technical, tactical and statistical data to provide information about specific skills and techniques.

This data can be use in follow up training sessions where changes can be made to optimise performance.



SKILL AND TECHNIQUE DEVELOPMENT

Data on 1st and 2nd serves will allow an tennis player to understand ball positioning and ratios. Training might then involve working on consistency of contact point and or depth of service.



ANALYTICS IN INJURY PREVENTION

Vibration therapy involves a **low frequency mechanical stimulation** of muscle areas to aid exercise recovery, prevent injuries and help with rehabilitation.

Other benefits include:

- Increased bone density
- Increased muscle mass/power
- Improved circulation
- Reduced stress
- Reduced effect of Delay Onset Muscle Soreness



ANALYTICS IN INJURY PREVENTION

Another advancement in technology to help with injury prevention is **Electrostimulation.** The impulses are generated by a device and delivered through electrodes on the skin in direct proximity to the muscles to be stimulated.

Electrostimulation can increase **strength and power**, with post-exercise recovery possible due to the electrical impulses assisting with the removal of lactic acid.



ANALYTICS IN INJURY PREVENTION

Electrostimulation also acts as a **rehabilitation** and **preventive tool** for athletes as the muscle can be gradually strengthened incrementally.



Long term exposure is not recommended and can result in saturation and therefore will limit the effects gained.

USE OF ANALYTICS IN GAME ANALYSIS

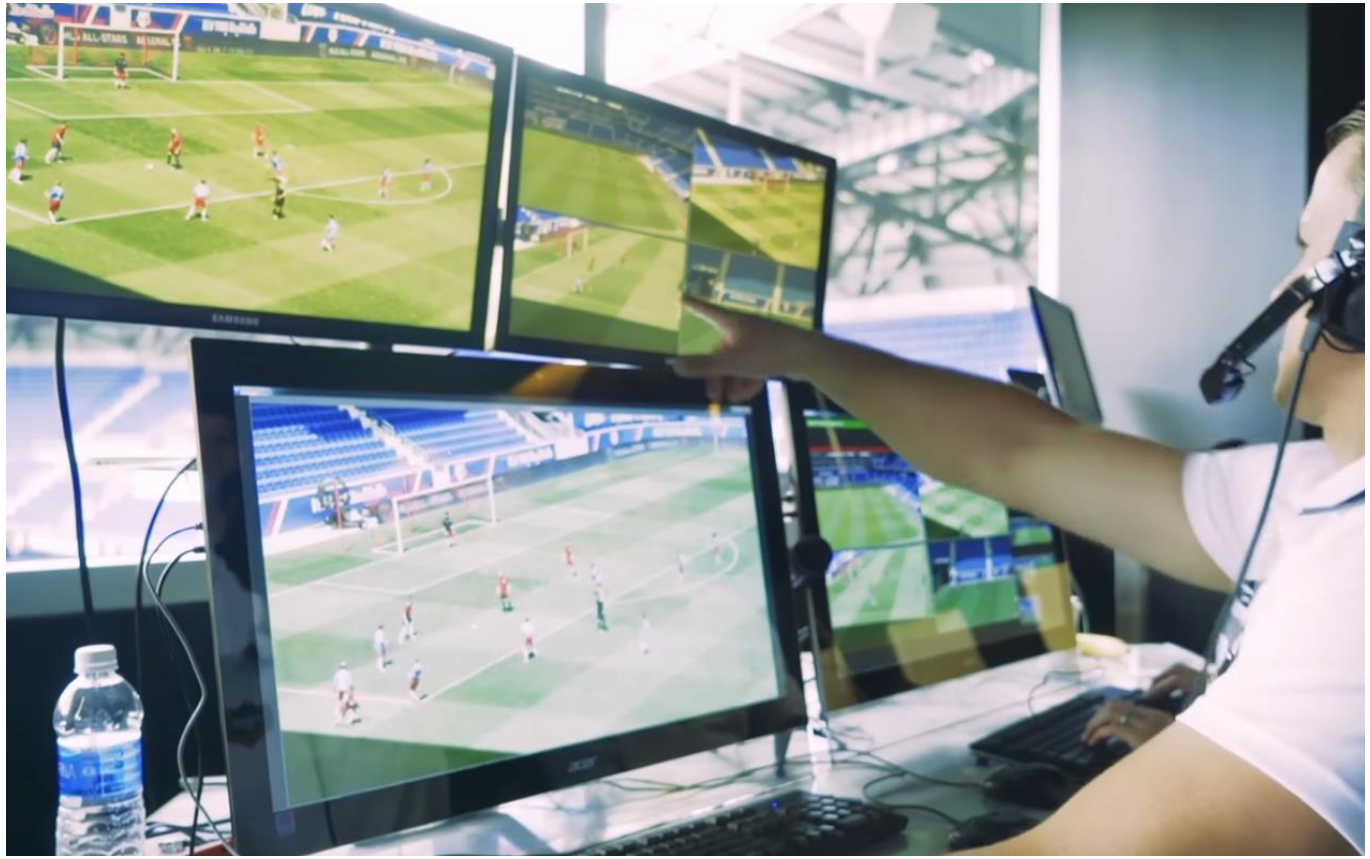
Team games such as football and basketball hove benefited from in game analysis to gather **quantitative data**.



Video is **captured** and **analysed** real time to provide **feedback** to coaches and players during games. The hope is this will give teams an edge over their opposition.

USE OF ANALYTICS IN GAME ANALYSIS

Coaches can also use this real time data to make changes to tactics, strategies and inform substitutions.



USE OF ANALYTICS IN TALENT ID/SCOUTING

Sports analytics is vital for **scouting and talent identification**. Information received can build up a profile of a performer and can measure effectiveness of training pathway and document progress.





Tall and Talented was an exciting initiative to find the next generation of Olympic gold medallists in rowing and basketball based on height and other systematic data .

DEVELOPMENT OF EQUIPMENT AND FACILITIES

Modern technology has benefited the **elderly and disabled** in a number of ways.

New devices are being developed to help participate at a recreational level as well as highly advanced equipment for elite Paralympians.

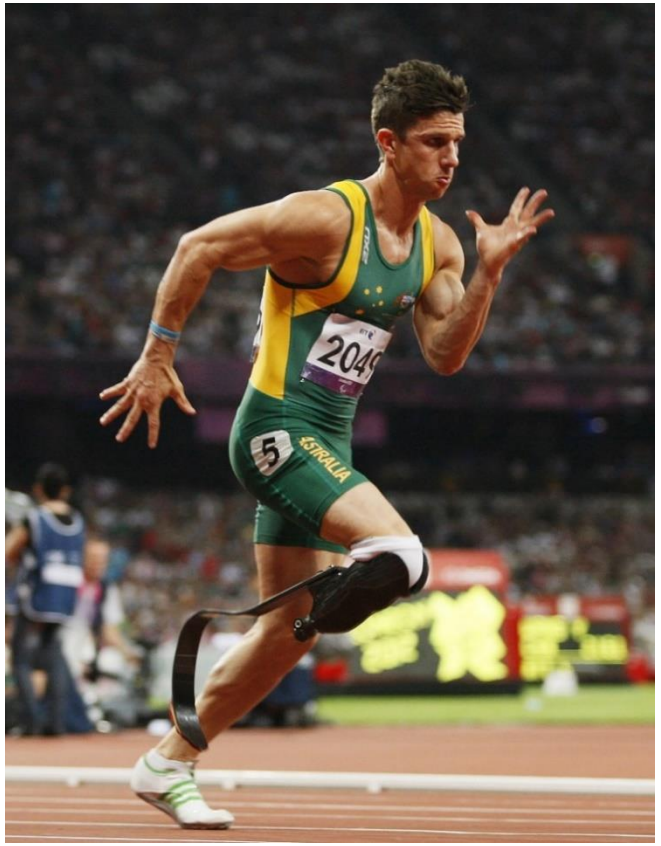
This includes **lightweight wheelchairs** designed for basketball, road cycling and sit skis.



DEVELOPMENT OF EQUIPMENT AND FACILITIES

Athletes with disabilities can now participate with the aid of **prosthetic limbs or modified equipment.** These are designed with lightweight materials and are bespoke to each athlete.

The **Cheetah** was the first sport foot of it's kind when first launched in 1996.



DEVELOPMENT OF EQUIPMENT AND FACILITIES

This technology has increases the participation of **disabled athletes** in a wider variety of activities, particularly **amputees**. This also opens up the possibility of disabled athletes participating in equal competition with able-bodied athletes.



DEVELOPMENT OF EQUIPMENT AND FACILITIES

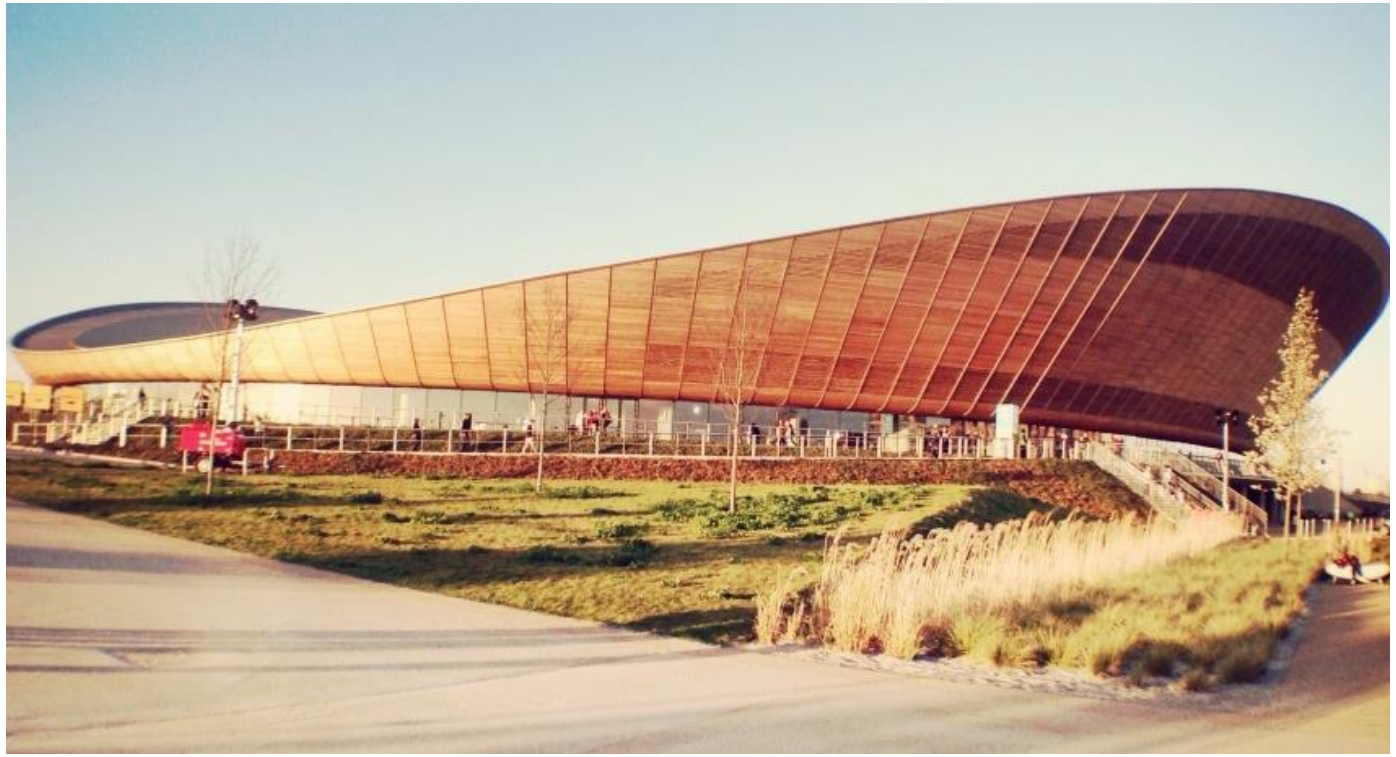
Improved **access** to buildings and sporting facilities has improved the provision for the disabled. **Swimming pools hoists, lifts and ramps** have increased the number of individuals taking up swimming.





TECHNOLOGY AND FACILITY DEVELOPMENT

Sport England along with the British Olympic Association ensured the Olympic legacy continued after the games by providing iconic facilities for the community use.



The Velopark and Aquatics centre on the Olympic site is available for public use and training.

TECHNOLOGY AND FACILITY DEVELOPMENT

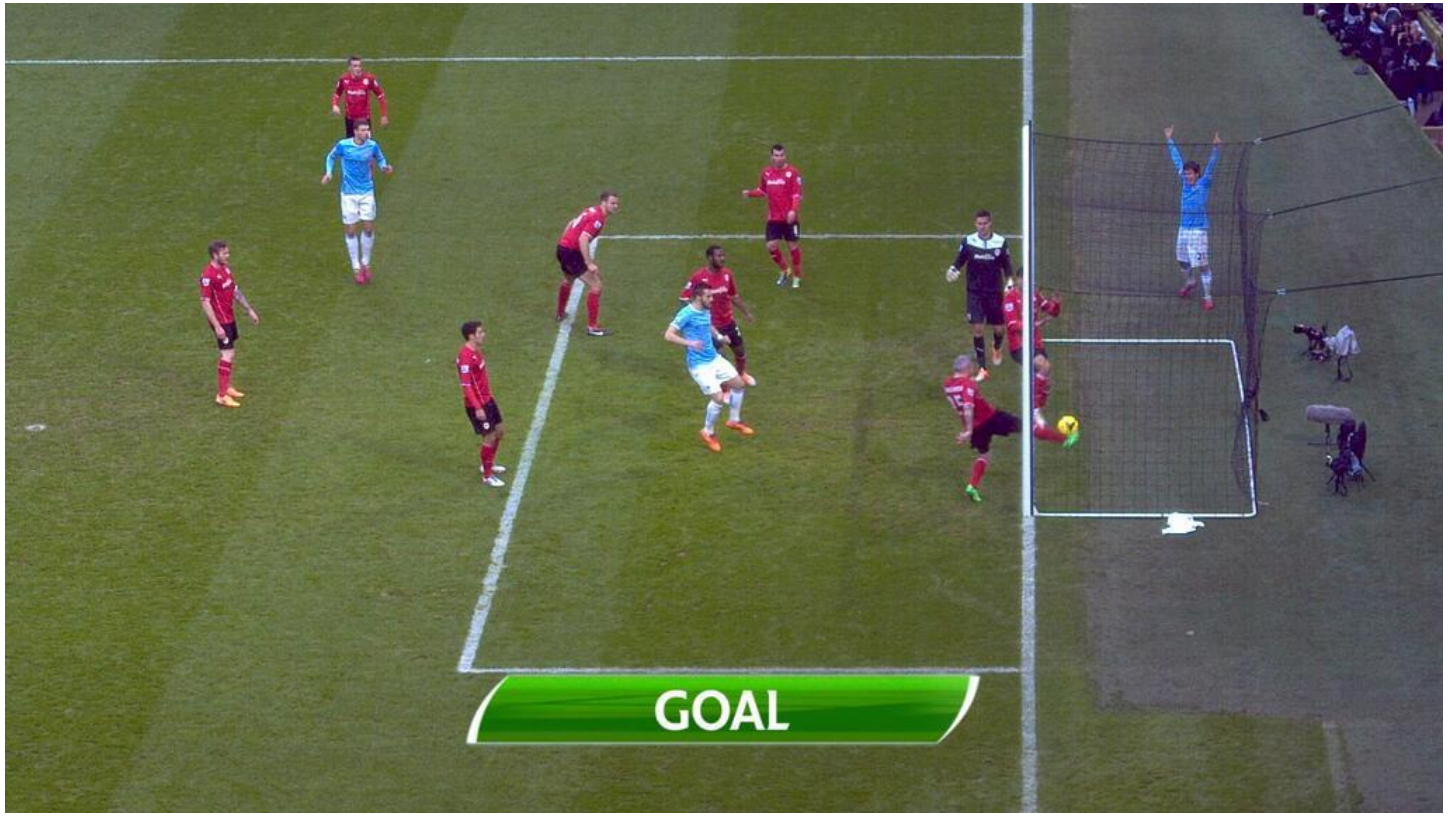
Developments to sports **facilities** have increase the participation rate in a variety of sports.

1. **Floodlights** – enable sport to be played during hours of darkness, increasing participation especially during winter.
2. **Synthetic surfaces** – enable play all year round in different weather conditions. Increases quality of play so may incentivise people to participate



ROLE OF TECHNOLOGY IN SPORT AND ITS IMPACT

The ethical issues surrounding the use of technology in sport is a widely debated one. Some believe it to improve the fairness of sport while others believe it to have taken away the drama and controversy that makes it sport so attractive.



ROLE OF TECHNOLOGY IN SPORT AND ITS IMPACT

The **positives** of technology for **performers** include:

Equipment and footwear research has altered sporting equipment to make performances faster and aid recovery. Often the materials are lighter and create more speed or power.







ROLE OF TECHNOLOGY IN SPORT AND ITS IMPACT

Players recovering from injury can be put in oxygen tents. **Altitude chambers simulate altitude** and bring about changes in the athlete's oxygen carrying capacity.

ROLE OF TECHNOLOGY IN SPORT AND ITS IMPACT

Safety - Athletes are able to compete in a safe environment thanks to developments in **helmets** and other **protective clothing**.





Additionally, increased in knowledge of **diet and sports supplements** means performers can take advantage of methods such as carbo-loading and sports drinks substances.

ROLE OF TECHNOLOGY IN SPORT AND ITS IMPACT

The **negatives** of technology for **performers** include:

- Chances of injury are increased as equipment is lightweight.
- Can lead to drug taking when substances are not enough.
- Expensive and unaffordable for some athletes.
- The availability of technology is dependant on individual or team sponsor.

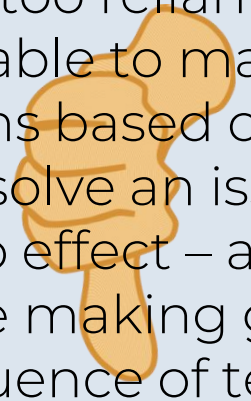


ROLE OF TECHNOLOGY IN SPORT AND ITS IMPACT

The **positives** and **negatives** of technology for **the sport** include:

Positive	Negatives
• Raises the profile of the sport and attract more participants. • Provides an inclusive nature of the sport for all to try it out.	• Can be expensive and not accessible by all. • Over analysis can mean the sport is too reliant on data and unable to make decisions based on feelings or to resolve an issue. • Placebo effect – athletes feel they are making gains from the influence of technology and instead in just increase confidence resulting in improvements.

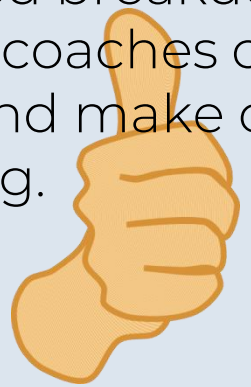




ROLE OF TECHNOLOGY IN SPORT AND ITS IMPACT

The **positives** and **negatives** of technology for the **coach** include:

Positive	Negatives
• Sports analytics can be highly informative. • Video analysis provides detailed breakdown from which coaches can work with and make changes to training.	• Over reliance on data to drive feedback and coaching methods. • Computer data and information open to breaches.





ROLE OF TECHNOLOGY IN SPORT AND ITS IMPACT

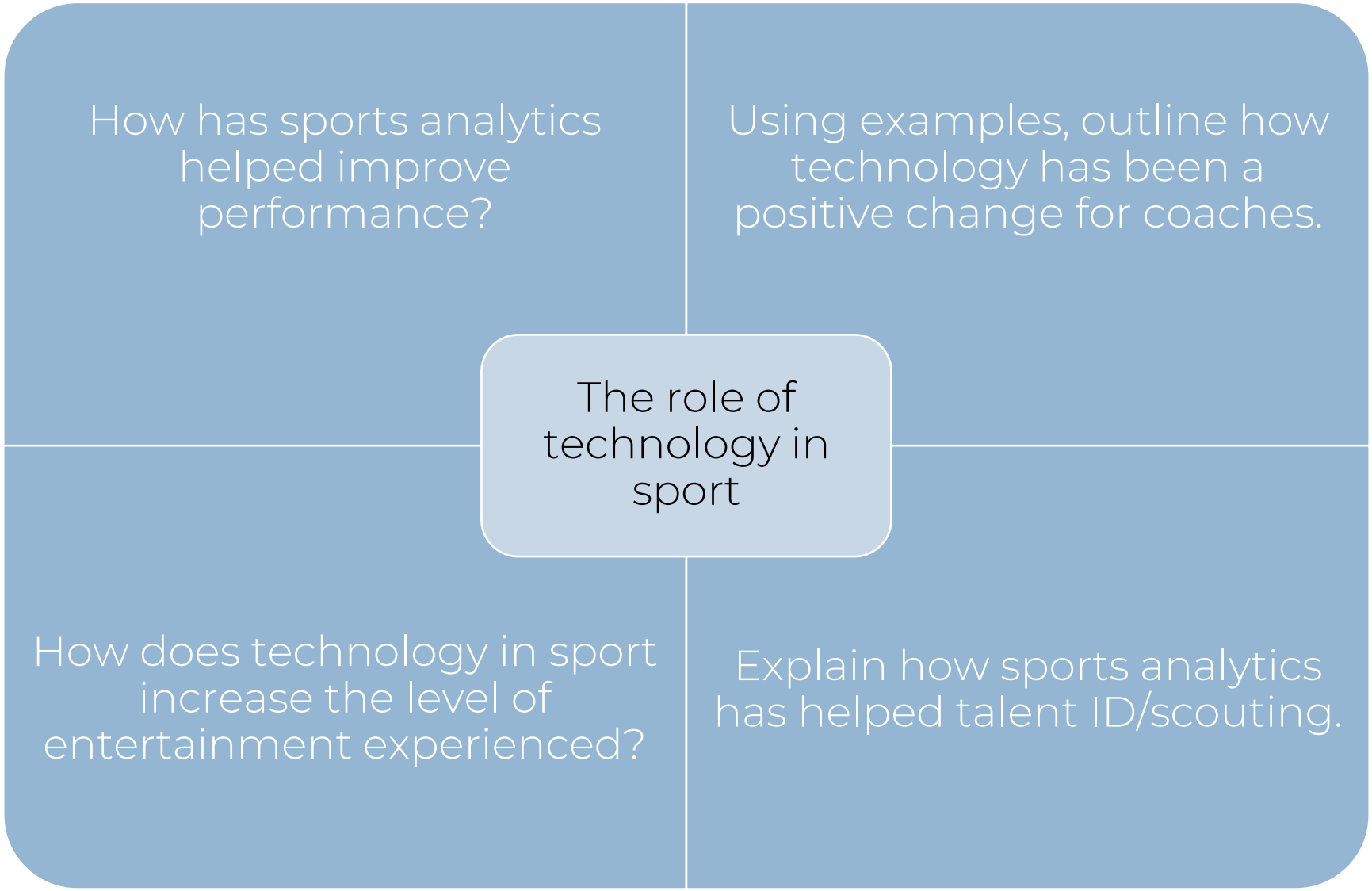
The **positives** and **negatives** of technology for the **audience** include:

Positive	Negatives
• Data and statistics on games improve spectators knowledge and understanding on all aspect of the sport. • Increased involvement and excitement (hawk eye replays)	• Breaks in play for video replays/challenges/TMO and cricket reviews can reduce the flow of a game. • Controversy of sport is removed which forms part of the excitement.





APPLY IT!


How has sports analytics helped improve performance?
Using examples, outline how technology has been a positive change for coaches.
The role of technology in sport
How does technology in sport increase the level of entertainment experienced?
Explain how sports analytics has helped talent ID/scouting.

PRACTISE IT!

Exam questions

1. Goal-line technology was introduced in football to assist referees in making decisions as to whether the ball had crossed the line and a goal had been scored.

The results of a poll taken of 100 spectators' views immediately following a football match were that:

- 20% stated that they were against the introduction of goal-line technology.
- 80% were in favour of goal-line technology.

Why might some spectators be against the use of goal-line technology and others be in favour of its introduction? [2]

PRACTISE IT!

Exam questions

2. State how the technological development of facilities and equipment can help to optimise elite performance. [4]

PRACTISE IT!

Marks Scheme:

1. (One mark for reason against goal-line technology from one of:

- takes away the ‘chance’ element of the sport
- enjoyment is decreased because of the lack of dispute / controversy
- too much time taken up or gets in the way of the flow of the game or too many delays
- technology inaccurate/wrong decisions
- changes the nature of the game as a sport

One mark for reason for goal-line technology from one of:

- it is fairer or judgments based on facts rather than perception
- excitement of waiting for the technological judgment
- takes pressure off referees or cuts down on human error

PRACTISE IT!

Marks Scheme:

2.

(Sports science support) – technology for biomechanical analysis to identify strengths/weaknesses in performance (1).

High quality facilities to improve training leading to increased fitness (1).

(Sports medicine) – technology for rehabilitation after injury for example soft tissue therapy (1).

Technological innovation leading to improvements in kit, eg climate control clothing (1).