Task 3

Describe the benefits of technological developments in equipment and facility design in two contrasting sports

Sport

Football

Equipment Design features and benefits

Football boots are light weight and are made of such materials as kangaroo leather. Most top level players have sock-liners which fit with the contours of foot to provide extra comfort and strategically-placed traction blades provide maximum grip. Football boots help with a player grip, acceleration and turning ability.

Footballs have had technological advancements such as having air retention system, being high density and having a high abrasion surface which provides extra durability. The match balls played with in the premiership is precision engineered to exact standards to ensure that it is produced to within 3g of its ideal weight and to an exact circumference of 68.5cm. The benefits of the newer footballs are the increased swerve that the ball offers and a better accuracy of passing.

Gloves The latest pair of reusch goalie gloves helps to prevent injury to the goalies hands through reusch Ortho-Tec glove which provides protection for vulnerable areas of the hand. The glove's upper hand is reinforced in a way that the fingers – including the thumb – are braced against forces occurring during a ball's impact. The system not only prevents injuries, it is also suitable to disburden and protect an injury already sustained. Gloves have also been adapted to different weather conditions as well; gloves are made from soft latex foam with excellent properties for use in various weather conditions. Goalie gloves benefit the goalie by mainly by providing extra grip and power.

Shirts The material design of footballs shirts have improved to provide better comfort. The new Manchester United kit incorporates Nike's new dri-fit technology. Dri wit wicks sweat away so that the player stays dry and comfortable. It also has strategically placed mesh panels that promote air cooling where heat is most generated.

Facility design features and benefits

Retractable roof – The millennium stadium in Cardiff has a retractable roof which means that the roof can be closed if the weather forecast predicts heavy rain. This benefits the game itself and the fans. It saves the fans from getting soaked and it saves the players having to slosh around in mud. Mostly cup finals are played at the Millennium stadium and the fans wish the game to be viewed on a nice good to firm ground not a wet one.

Undersoil heating – Is valuable asset and a must for all big football clubs. It can allow a team to play or train on a pitch that the weather would otherwise have made unusable or it can generally soften up the ground for training purposes.

Astroturf pitches – For training purposes Astroturf is of benefit to players because Astroturf is all weather, meaning that when the players unable to play on their training pitch die to water logging they can go and train on the Astroturf pitch instead.

Video Analysis – Andy Gray is probably the most renowned broadcast analyst in the football industry. He has a 30 minute slot after most live sky matches in which he practically dissects the game explaining the reasons goals were score and analysing player performance.

Sport
Tennis

Equipment Design features and benefits

Racquets - Tennis has changed drastically since the huge investment in technological advancements the main one being the racquets. They now look completely different to those of 20 years ago, they are now lighter, and have larger faces and shorter shafts. This has created a larger sweet spot and has encouraged players to increase their power. By increasing power to a phenomenal level the game is often much shorter as the serve can kill a game off. This is mainly because the way in which the rackets have been made. This has made tennis players adjust everything about their game, from positioning, this is now further back for the serve, to two-handed return to try and increase power. The player now trains more on power based activity service technique.

Trainers – Tennis shoes have changed greatly over the years. Reebok have recently developed the DMX technology. This is a sole that claims to reduce the stress on the legs and heels when running; it does this by shifting the force of the impact across a wider area on the foot. This material is also light and so is easy to run in and can help to improve performance. Another company big among tennis players is New Balance who also have their own suspension system. This consists of various different parts of a sole that all work together to reduce the impact on the foot as well as stability in the way that it reduces rolling of the foot as well as over pronation. New Balance also have a brand, called Abzorb SBS, it has been developed so that when impact with the ground has been made the technology displaces the energy over the whole foot. Asics developed gel technology in their trainers nearly 20 years ago and it is still in their trainers today, the silicon gel attenuates the shock made on impact and works in conjunction with the lateral rear foot flex grooves within the sole to improve comfort.

Tennis Balls – There are different types of tennis balls depending on what surface the game is played on. Some balls are designed for hardcourt and grass, while others are designed for clay courts. The ball can vary by about 1/8 of an inch in size and 1/16th of an ounce in weight. Its rebound height can vary almost 10%. The stiffness, defined by the deformation under pressure, can vary over 5%. The benefits of the different types of tennis balls are that a player can choose a set of tennis balls depending on his style of play or the type of court he is playing on.

Shirts – Top players such as Raphael Nadal are sponsored to wear Nike's dri-fit range of shirts. This shirt has all the benefits that I described earlier regarding those in football who dri-fit. Other benefits of the shirts are that they have the seams sewn flat to eliminate chafing.

Facility design features and benefits

Fast Dry Courts - What's new is that today's courts are being watered from underneath. This changes a lot of things, not the least of which is the way fast dry courts play. The benefit of the fast dry court is that it allows players to play when they would otherwise not be able to. These types of dry court surfaces don't get saturated with water and water is not allowed to seep into the base material.

Cyclops - Cyclops technology helps tennis umpires by emitting a loud beep when a ball lands outside the service area. This helps the umpire with important decisions that could decide big matches such as Wimbledon or the Davis cup.

Hawkeye – Hawkeye is being tested at the moment before being used in all 4 majors. It has been used in the Australian open where it helps the umpire to make line calls. The benefits to tennis is that if accurate hawkeye will give us a fair tennis result there will be no more John McEnroe's "I don't believe it" just a fair accurate result.

PRM – PRM has been developed by IBM to help the players and coaches plan their tactics for the tournament. Vital match data is gathered by courtside experts and fed instantly via powerful IBM servers to coaches and players in formats suited to their specific needs. With this data to hand, they can iron out their game, or use it to find weaknesses in their next opponent's, which makes for better games.

Compare the benefits of technological developments on equipment and facility design in two contrasting sports

Similarities

- Boots and the trainers that Footballers and tennis players wear have their similarities. Both aim to deliver the performer maximum comfort much in the same way through modern materials and being lightweight. Both sets of trainers have a cushioning effect of some sort and both sets of trainers have been modified over the years to help improve his performance. Elite tennis and football players all wear branded boots and trainers that claim to improve various things such as power, balance and grip.
- The changes in footballs and tennis balls have a slight similarity. Tennis balls have been adapted over the years to be played on different courts. At one time their was just one type of tennis ball now there is one for grass courts, hard courts and soft courts. The football has changed their balls in that there are different colors balls depending on weather and both sets of balls have been made more aerodynamic over the years.
- The fast dry courts in tennis have an irrigation system underneath which stops the courts from becoming waterlogged. Football have a similar system called undersoil heating which also sits underneath the field of play but helps more with stopping the pitch becoming cold and hard.
- Cyclops technology in tennis helps with decision making. In football as of yet there isn't computer technology that helps with decision making. But there are new technologies being developed in football with one being tested right now in a junior football championship. There is a small microchip place in the football which enables us to find out through signals sent to a computer whether the ball has crossed the goal line or not. The similarities between the two sports are that they are both looking to improve their games through the use of technology.
- Finally retractable roof technology came to football in the form of the millennium stadium which allows us to watch the cup finals without the threat of rain. The same technology is being developed at Wimbledon hopefully coming into affect for the 2009 championship. They are looking to put a retractable roof over the centre and 2nd court to finally stop the rain from ruining our championships.
- The biggest similarity between the two sports is the improvement in shirt technology. The shirts that a worn between the elite players of football and tennis are very similar with the elite athletes both using Nike's dry fit technology and adidas's climacool technology. Both sets of players reap the benefits of more comfortableness and improved abilities to wick sweat away.

Differences

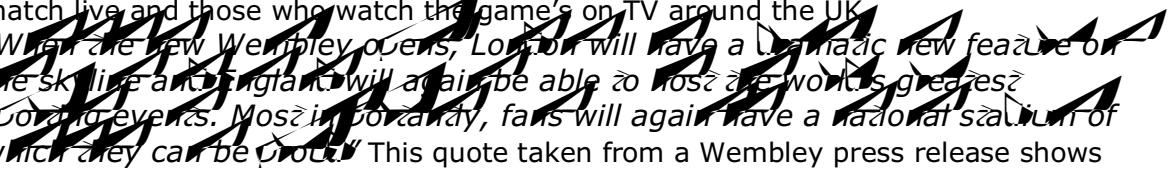
- One of the main differences is that of technology that is already in place and of the technology that is not yet in place. For instance the retractable roof is already in place in football but not as yet in tennis, Line decisions are in place in tennis but not as yet in place in football.
- The differences between undersoil heating and the dry court technology. For instance if there was a major frost on a dry court the irrigation system wouldn't be able to deal with it as effectively as the undersoil heating which is made more to combat frost and snow.
- There are many similarities between the trainers/boots used in the sports but the main difference between the two is the materials that construct the boot itself. Tennis and football are two very different games so you would expect the footwear to be different in many ways as well. Separating the trainers/boots comes down to durability. A football boot is a lot harder than a tennis shoe it is made up of tougher leather which makes it more durable. Football unlike tennis is a contact sport and with players stamping on your foot in football the evolution of the boot has been to make it harder,
- Tennis balls like footballs have changed over the years adapting to different surfaces, weather conditions and being made more aerodynamic. The tennis ball material though hasn't changed for a very long time, it is still made of the same synthetic material and yellow felt that it was thirty years ago. On the other hand the football has changed a lot more dramatically over the last 30 years with the balls changing to a synthetic material which makes it unbelievably light. Over the years there have been a lot my adaptations to the football than the tennis ball.
- The racquets in tennis show a remarkable technological change over the years. A change that has made a dramatic change to the game of tennis and given a major advantage to those with natural power. I can't think of any technological advancement in football that has a big of an impact as the racquet has in tennis.

Write a memorandum commenting on the benefits of technological developments on equipment and facility design on sport in the UK.

Memorandum to the Chief Executive on the benefits of good facility and Equipment design to the UK

Application of technology in sport facility design has yielded real changes in terms of athlete use, spectator comfort and usable life span for the UK. The biggest facility that is being built at the moment is Wembley stadium of which the benefits to the UK are massive! The UK will have a 2nd stadium to be proud of the other being the Millennium Stadium. Having two major stadiums in the UK will boost our chances of hosting a future World Cup and other sporting events. Wembley stadium will have its old capacity of 80,000 increased to 90,000 making it one of the biggest stadiums in the world. The Stadium will also bring a lot of economic benefits to the UK one of being transport to the stadium being made easier. £35 million is being invested in The Wembley Park Tube Station and a new road linking the stadium with the North Circular road. This benefits spectators in the UK more than anyone else. There is a great technological advancement that is going to be introduced to Wembley Stadium. The stadium is going to have a partially retractable roof which will provide

spectator shelter whilst not covering the pitch, allowing sunlight and air onto the pitch and ensuring that Wembley's famous pitch remains one of the finest in the world. It also means those on bright sunlit days, the roof can retract, keeping the heavy shadows that TV cameras struggle to deal with, off the pitch. These are basic improvements that help the viewing pleasure of those who go to watch the match live and those who watch the game's on TV around the UK.



"When the new Wembley opens, London will have a landmark new feature on the skyline and England will again be able to host the world's greatest sporting events. Most importantly, fans will again have a national stadium of which they can be proud." This quote taken from a Wembley press release shows what having this new stadium means for sport in the UK. Whilst Wembley has been gone it has been sorely missed in the world of football and Rugby and it's return may initiate a boost in the participation of the two sports. There has also been improved communications technology for in-stadium displays such as scoreboards and broadcasting make the events more enjoyable for the spectators not just at Wembley but all the other stadiums around the country. Technological advancements in stadium building for instance what those who built the Millennium stadium learnt can apply this to Wembley stadium will be built better than all of the other previous stadiums in England and this will extend the life of the facility and the facility should be safer for the participants and less costly to maintain.

Technological changes have resulted in facilities that are more cost efficient to operate resulting in the freeing up of scarce financial resources for programs which would have otherwise been expended for operating costs such as utilities. Among these advances are lighting options that extends the useable hours of facility operation. An Example is how the lighting has changed at football grounds. Instead of four stand alone floodlights at each corner of the pitch there are new floodlights which cover everything and are more cost effective to run than the old floodlights. This benefits the clubs in the UK in a financial sense and all the spectators who go to watch games.

Technological change in sports facility frequently results in better building finishes that extend the life of the facility, are safer for the participants and are less costly to maintain. Most notable in this area are finishes such as sports flooring and playing surfaces.

Further benefits to facility design in the UK regard the Wimbledon Centre court. Wimbledon is arguably the biggest major in tennis and year by year games are ruined by the rain. A retractable roof is proposed to be put in for the 2009 championship. The benefit again is more to do with the spectators from the UK that go to support their favourite tennis players. Days are often washed out in which people waste their time buying tickets and not seeing a game. There have been games when some people debate that a player would have won had there not been a break for rain. The retractable roof will solve all those problems and at the same time prove that Wimbledon is the elite event when it comes to tennis. This sets an example of a technological improvement to the other major holders outside of the UK like the US and Australia. The technological improvement makes the UK look good because we are looking to improve our championship for everyone.

Another stadium that has been recently developed is the Millennium Stadium in Cardiff which along with the newly built Wembley Stadium will increase the chances of hosting a Rugby World Cup. Hosting a major tournament is of a major importance to the UK. It will bring in so much money from different areas it is unbelievable. Overall hosting a major tournament will produce a major economic boost for the UK as well as increasing participation in that sport. This is why the UK always contests for every cricket, football and rugby World cup so vehemently and

why we worked so hard to get the 2012 Olympics. This is also why we are building bigger and better facilities because if you want to host big events the easiest way to appeal to an elective committee is to have better facilities than all the other competitors. Having the first retractable roof In British football will help greatly to attract events to come to the Millennium Stadium and the Millennium stadium has and will continue to create many jobs for people living in the UK.

When it comes to equipment design there have been construction benefits in the application of composite materials which reduces weight while yielding increased strength and extended life spans. Composite materials can be found in high level competitive equipment such as bikes, skis, racquets, and other types of gear such kayaks which almost by definition are targeted toward the elite competitor. The benefit to those in the UK is that advances in materials have made sport participation safer and has penetrated down the sports hierarchy to the recreational user, for example, in items such as bike helmets. The other benefit I can think of to the UK is that better equipment design has led to better performance. This is from grass roots level all the way to the top. Children playing at their local tennis courts are benefiting from lightweight and durable racquets the same way that players at the top such as Andrew Murray are.

A big technological advancement to help sportsmen in the UK is that of the hypoxic tent. Sportsmen living in countries such as South Africa, Peru and Mexico have had a natural advantage over our athletes. In the past our athletes would have had to have flown over to one of these countries in order to train at high altitude but now there are hypoxic tents which athletes can use in the comfort of their own home. This is of enormous benefit to the UK because it has helped bridge the gap and put our athletes on par with those athletes from high altitude countries. Hypoxic tents have also been known to help with injuries the most high profile case being David Beckham who claimed that his foot injury would never have healed in time for the world cup had he not used the hypoxic tent. Injury prevention has also been of benefit to the UK, new designs in injury prevention equipment have enabled players to come back from injuries that they never would have come back from in the past. I remember when a footballer used to have a cruciate ligament injury it used to mean that his career was virtually over, nowadays 90% of all players come from cruciate ligament injuries. This has helped players in the UK from your local pub teams to your Premiership clubs.

Lastly, improvements in technology benefiting the UK can also be applied to personal sports gear such as clothing and shoes. A recent, albeit controversial example, is the full body suits used by our British swimmers which streamline the competitor reducing times in a sport where winning or losing is measured in hundredths of a second.