

Appendix 2: Performance Analysis and Performance Development Programme (PDP) authentication sheet

Pearson Edexcel Level 3 Advanced GCE in Physical Education		9PE0/04
Centre name: [REDACTED]		Centre number: [REDACTED]
Candidate name: [REDACTED]		Candidate number: [REDACTED]
Performance Analysis and PDP start date: SEPT 2017		Performance Analysis and PDP completion date: DEC 2017
Activity	Mark awarded	Comments [NB: Comment box expands as you start entering text]
Performance Analysis: physiological component	8 /10	3/4
Performance Analysis: technical/tactical component	8 /10	(3)/4
PDP: planning	9 /10	4
PDP: review and evaluation	9 /10	4
TOTAL	34/40	15

Teacher declaration

I declare that the work submitted for assessment has been carried out without assistance other than that which is acceptable according to the rules of the specification.

Assessor name:	[REDACTED]		
Assessor signed:	[REDACTED]	Date:	11.5.18

Candidate declaration

I certify that the work submitted for this assessment is my own. I have clearly referenced any sources used in the work. I understand that false declaration is a form of malpractice.

Candidate signed:	[REDACTED]	Date:	09/05/18
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Additional candidate declaration

By signing this additional declaration you agree to your work being used to support Professional Development, Online Support and Training of both Centre-Assessors and Pearson Moderators. If you have any concerns please email: teachingPEandSport@pearson.com

Candidate signed:		Date:	
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This form can be adapted by centres as required.

Netball

↑ no research into this

Physiological - power, agility, coordination?

- Power - 30m sprint - not appropriate or specific - contradicts themselves in validity section
- some justification but mainly subjective.
- No future training priorities. - normative data

Technical - chest pass

- 3 photos through all phases of candidate & elites, however analysis would have been better presented if there were annotations directly on photos.
- generic / weak analysis. Descriptive. Lacking biomechanical / physiological aspects as well.
- no real S&Ws identified

Planning - power

- SMARTER - descriptive & brief
- Principles - some signs of detail but did not go any further. Could have developed some points mentioned
- methods - some detail on plyometrics, with examples of exercises, however still lacking detail & research
- vertical jump, press-up?? & 30m sprint test used.
- training logs present. → rep ranges represent more muscular endurance
what % of 1RM??

Evaluation

- review of test improvements
- mentions neuromuscular adaptations but must be careful how this is worded!
- some good points re: recovery between plyometric sessions, however this could have been included in the principles section
- Does review rep ranges

PE

Performance Analysis

Netball

XXXXXXXXXX

Candidate number: xxxx



Introduction

I have decided to focus on netball as my sport. In netball, different fitness components are combined to provide optimal sporting performance (e.g. performing a netball shot, playing mid-court). The most important components in netball are power, agility and coordination.

Power-

'the ability to exert maximum muscular contraction instantly in an explosive burst of movements'. This is important in netball as you need a combination of speed and strength in jumping or sprinting to obtain the ball.

Agility-

'the ability to perform a series of explosive power movements in rapid succession in opposing directions'. This is the most important component in a netball game as you need to make sharp movements in Zig-zag movements to trick players into going a different way and obtaining the ball from your teammates.

Coordination-

'the ability to integrate the above listed components so that effective movements are achieved'. This is needed in netball as you need to link all the movements together to perform an overall good performance. It is needed when you are throwing and passing a ball, and shooting.

I have decided to look at power, agility and coordination for my key components, as these are the most important in playing netball. You need power to accelerate at a quick speed, agility to be able to change direction instantly, and coordination to be able to direct the ball in the right direction.

Power

For power, I have decided that the 30-metre speed test would be the most suitable for netball. It tests how fast I can accelerate, and involves me sprinting 30 metres. I ran 6.06 seconds in my initial test, which was fair for the normal average. To improve my score, I'd have to do plyometric training to improve my speed and power (as it's anaerobic exercise, recruiting fast twitch muscle fibres).

Type of test	My score	Normative data comparison
30 metre sprint	6.06 seconds	Fair

Table to show the general ratings of this test-

rating	men	women
very good	< 4.80	< 5.30
good	4.80 – 5.09	5.30 – 5.59
average	5.10 – 5.29	5.60 – 5.89
fair	5.30 – 5.60	5.90 – 6.20
poor	> 5.60	> 6.20

* for Australian team sport players

Source: <http://www.topendsports.com/testing/tests/sprint.htm>

Reliability-

My 30-metre sprint test is not that reliable because we are using a stopwatch to measure the sprint. This is not that accurate, so therefore the reliability is not that great. It would be better if I had used timing gates, and this would've increased the accuracy more. However, the same conditions were used, and I had performed it on a surface that is usually played for netball.

Validity-

This test is valid for netball because you need to be able to accelerate very quickly to obtain the ball. However, it is not as valid because in netball, you don't really have to sprint 30 metres, but instead you only must sprint short strides. It is more beneficial to do a standing speed test (instead of the moving acceleration test) because it tests your acceleration ability and reaction time, which could be more suited for sprinting at the start of a netball game.



Agility

I decided to do the 'T' test because it tests my ability to change direction. It required me to touch a series of cones set out in "T" shape whilst side stepping and running as fast as possible. I ran 10.58 seconds for this test, and comparing it to the normative data I can see that it was below average. Therefore, to improve my agility levels and previous score, I would have to do this test a lot, and do plyometric training.

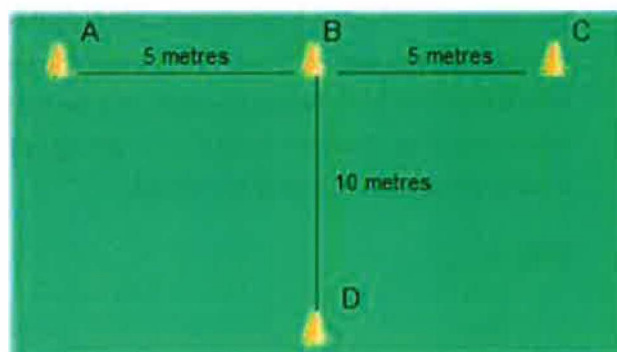
Type of test	My score	Normative data comparison
T test	10.58 seconds	Below average

Excellent	Above Average	Average	Below Average	Poor
<10.01 secs	10.01 - 10.13 secs	10.13 - 10.37 secs	10.37 - 10.67 secs	>10.67 secs

<https://www.brianmac.co.uk/tdrill.htm>

Reliability-

This test was accurate (therefore more reliable) because we used time gates at Loughborough University to measure the start and finish. Also, we had measured out the distances carefully, so it provided reliable results. However, due to time constraints I only did the test once, so we couldn't do it 3 times and get an average.



Validity-

This test is considered valid for netball because you need to be able to change your direction very quickly to trick the other players. Also, in netball, it is important to side step (which is normally done in a warm up). However, you may not necessarily need to use this direction of movement throughout the whole game (as sometimes you may just need to move backwards etc.).

Coordination

The coordination test tests my ability to control the ball. It is needed mostly when you are shooting and throwing the ball to other players. I got 26, which was considered average. This test is important in netball as it improves coordination, so you are able to throw and catch the ball accurately.

Type of test	My score	Normative data comparison
Hand Eye Coordination Test	26	Average

Table to show the general ratings of this test-

Rating	Score (in 30 seconds)
Excellent	> 35
Good	30 – 35
Average	20– 29
Fair	15 – 19
Poor	< 15

Source: <http://www.topendsports.com/testing/tests/wall-catch.htm>

Reliability-

This test is reliable because it doesn't rely on technology, which could be inaccurate readings. Also, to measure the 2 metre distances away from the wall, we'd use a piece of tape so that it is accurate.

Validity-

Although this test does test my ability to control the ball, it isn't that relevant to netball because in the test you are using a tennis ball. Also, you're testing the amount of single catches you make when you bounce the ball on a wall. This is not the same in netball, because you are using a bigger ball which requires both hands to catch. It'd be better if I used a standing stork test, as balance is needed when shooting. Another thing that is wrong with this test is that it tests the skill of bouncing a ball on a wall, which isn't relevant to netball.

Performance analysis

As a netball player, I have chosen a chest pass to focus on as my skill. For this, I need power and coordination to excel myself forward and pass the ball.

Preparation



- My hands formed a w shape behind the netball with my thumbs together and fingers holding the ball. I brought my thumbs together in the centre with my fingers comfortably spread out. This allowed me to get a good grip on the ball and therefore pushing it with more force.
- The ball is kept close to my chest. It is at chest height, that way it is a faster pass so it's harder to intercept (flexion is happening within the elbows).
- I am facing towards the direction that the ball will travel, and my hips are not rotated. This enabled me to gain more momentum when pushing off the ground.
- My head is aligned with my body and is at the centre, and my back is straight, which means the centre mass is equal on both sides to provide more balance.
- However, my feet should've been shoulder distance apart for more balance and power. My legs are slightly wider apart from the professionals', but saying this, I was in motion whilst performing this pass. Also, in netball, you can stand in a position that will give you the best balance and opportunity to step through the shot. As my legs are long in comparison to my body, having a wider distance between my feet perhaps aided my shot as I could bend my legs and initiate more powerful movements.
- My back foot should've been flat on the floor and my front foot dorsi flexed. Doing this would've helped push off from the floor to gain a more powerful shot. To improve, I just simply need to land on my ankle instead of the base of my foot so the movement is more flowing.

Execution



- As I prepared to pass the ball, I kept my eyes on the destination. This will help follow the ball through and get as much power out of the pass as possible.
- I extended my arms fully because it helps gain momentum and extra power to the shot (the faster the ball travels, the less likely it is to be intercepted by another player). My arms are in the perfect position and are like the professionals.
- The ball was released evenly in my hands and both my arms were extended the same length. This meant I didn't lose control and the ball went in the direction I intended.
- My back foot was plantar flexed to the ground, and when I compare it to the professionals', theirs are the same. This was due to me pushing off my back foot onto my front foot to get as much momentum as possible.
- If I could've improved anything I probably could've extended my legs slightly more, so I followed the ball even further. When looking at the professionals', they are straight, so if I straightened my legs an extra 35° would've made a full extension of the legs, and I could've added that extra power through the pass.

Recovery



- I kept following the ball through with my whole body so there was the maximum amount of power. A chest pass overall should be one that can be played easily and quickly.
- My body weight was on my front foot which I leant on because I wanted to follow the ball through completely and extend my leg.
- In comparison, pronation is taking place in both mine and the professionals' hands (both hands are pointed downwards). This is important because the flick of the wrist when passing the ball helps it fly easily and gain maximum power.
- I still looked at the destination intended because it helps follow the ball through. By doing this, it traced a smooth path through to the point at which I aimed it, without bouncing.
- My back foot is preparing for the next run as it is flexed. Although this might benefit in a fast pacing game, the professionals back foot is still placed on the ground, and when comparing it I could've extended it slightly, so it gave me that extra balance. Therefore, it would be 180° rather than bent at a 95° angle. Overall, my next run is going to start by bringing my back foot forward.

Overall, the main thing I'd improve would be to extend my legs more so I follow the ball through, and it gives an extra boost of power through the pass.

Performance Development Programme

For my PDP, I am going to focus on Power, as netball requires both speed and strength when sprinting for the ball.

SMARTER targets

Smarter targets are good for training and ensuring development because it means you can plan your training and make it directly for the component of fitness you are improving.

Specific

The training must be directly related to a sporting situation so that you gain in that component of fitness. For netball, I have focused on improving my power in the form of plyometric training, so it increases my strength and ability to move quickly in different directions.

Measurable

The method of training must be measurable and so the progress can be assessed. In netball, I will assess my reaction time of when the whistle is blown to me running for the ball.

Achievable/Accepted

The performer, coach and manager must make sure the goals you have set are achievable and everyone agrees that it's the area to improve on.

Realistic

This means the method of training must be challenging but within the capability of the performer. As I will be doing plyometric training, this means I will be performing with maximal intensity and I will be looking to improve my power.

Time-Bound

My programme will be over 12 weeks. It is important a date is set for completion so that the performer can have goals to reach and this will increase their motivation to achieve their full potential.

Evaluated/Exciting

If the training is not exciting, then tedium will arise, and the performer will soon get bored. It must be inspiring and rewarding to the performer, so that they have something to work for. In my training programme I have switched up different exercises so that I do not get bored.

Recorded

The training must be written down, so you can understand and improve on your fitness levels. By doing this, a performer can also look at what areas they are weakest at and they can then improve on that component of fitness with specific training. It also makes it real that you are doing a fitness programme and it makes it easier to follow/remember.

Source: A2 revise PE for Edexcel, Jan Roscoe publications/ISBN 978-1-901424-55-3 Edexcel A2 PE textbook/ISBN 978-0-435500-60-3

Principles of training

The key principles of training a coach and performer need to consider include;

Specificity

With regards to exercise, specificity is defined as 'the relevance of the choice of exercise to the activity to be improved'. This means that the training programme must stress the physiological systems that are critical for optimal performance in the given sport. Hence, for netball, this would be power and agility which is comprised by the ATP-PC system.



Reversibility

This is defined as 'when training loads are reduced or removed completely, the state of fitness or performance returns to a normal untrained state'. This explains why performance decreases when training stops or the intensity is reduced (may be due to an injury by the athlete).

Progressive overload

This means that training activities are harder, more intense and or lengthier than the normal physical activity undertaken. In my training programme I have used this by increasing the; number of sets and repetitions, resistance, and recovery period each session.

FITT principles

Frequency- How often the individual trains

Intensity- How hard the training is

Type- What type of training it involves

Time- How long the individual trains/duration of training



Over-training

This is defined as 'when the intensity of training and/or volume of training are increased to an extreme level, which results in a lack of recovery within or between training sessions leading to an associated decline in physiological function'. In my programme I will be increasing the intensity every week, but also having 6 recovery days where I will not be performing plyometric training.

Variance

A lack in variety in training could result in tedium and boredom, therefore the coach must try and vary the sessions so that they are not the same and it increases the athletes' motivation and drive to achieve. I have varied my exercises each week, so it is exciting for me to do.

Individual needs

This means suiting the training to the individual and what the sport demands, for people with injuries, and at different ages etc. For netball, plyometric training suits this sport because it improves power which is needed for bounding sprints.

Source: AS revise PE for Edexcel, Jan Roscoe publications/ISBN 978-1-901424-54-6

Power- Plyometric training

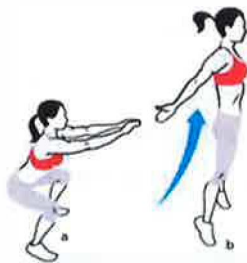
Power is 'the ability to use strength quickly'. I will be doing plyometric training to improve my power as it involves bounding and jumping at different heights. This involves using both speed and strength. Plyometric training is originally created to be the "Shock Method." The explosive movements and stress on the muscles will improve the body's reaction time and forceful movements.

In my training I will be using explosive strength activities such as box jumps, broad jumps, burpees and scissor jumps to stress the anaerobic system. This will hopefully improve my strength and provide muscular hypertrophy so that I can perform with greater power in netball.

Source: Edexcel A2 PE textbook/ISBN 978-0-435500-60-3

Training exercises

Squat jumps



Scissor jumps



Skater jumps



Broad jumps



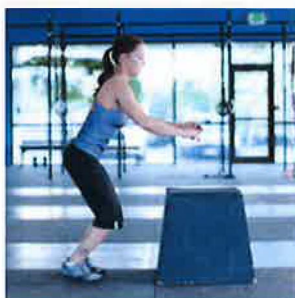
Burpees



Lateral box jumps



Front box jumps



Mountain climbers



Press ups



For each session, I will increase the amount of reps and decrease the recovery time. This will increase the intensity and stress the anaerobic system to improve my power.

Normative data

I will measure pre, during and post my training (before, 6 weeks in and after) on how high I can jump in the standing vertical jump test, and how many press ups I can physically do until exhaustion. For my original fitness test, I performed the 30-metre sprint, so I will also measure this as I can see if my plyometric training has improved my power.

Standing vertical jump test

rating	males		females	
	(inches)	(cm)	(Inches)	(cm)
excellent	> 28	> 70	> 24	> 60
very good	24 – 28	61–70	20 – 24	51–60
above average	20 – 24	51–60	16 – 20	41–50
average	16 – 20	41–50	12 – 16	31–40
below average	12 – 16	31–40	8 – 12	21–30
poor	8 – 12	21–30	4 – 8	11–20
very poor	< 8	< 21	< 4	< 11

<http://www.topendsports.com/testing/norms/vertical-jump.htm>

Standing vertical jump test	Pre	During (6 weeks)	Post (12 weeks)
Score (cm)	25	30	38
Normative ranking	Below average	Below average	Average

Press ups

Age	17–19	20–29	30–39	40–49	50–59	60–65
Excellent	> 35	> 36	> 37	> 31	> 25	> 23
Good	27–35	30–36	30–37	25–31	21–25	19–23
Above Average	21–27	23–29	22–30	18–24	15–20	13–18
Average	11–20	12–22	10–21	8–17	7–14	5–12
Below average	6–10	7–11	5–9	4–7	3–6	2–4
Poor	2–5	2–6	1–4	1–3	1–2	1
Very Poor	0–1	0–1	0	0	0	0

Source: <http://www.topendsports.com/testing/tests/home-pushup.htm>

Press ups	Pre	During (6 weeks)	Post (12 weeks)
Score (amount of press ups)	30	34	38
Normative ranking	Good	Good	Excellent

30 Metre sprint test

rating	men	women
very good	< 4.80	< 5.30
good	4.80 - 5.09	5.30 - 5.59
average	5.10 - 5.29	5.60 - 5.89
fair	5.30 - 5.60	5.90 - 6.20
poor	> 5.60	> 6.20

* for Australian team sport players

Source: <http://www.topendsports.com/testing/tests/sprint.htm>

30 Metre sprint test	Pre	During (6 weeks)	Post (12 weeks)
Score (mins)	6.06	5.88	5.58
Normative ranking	Fair	Average	Good

Body weight

Before	After
54kg	55kg

Session	1		Plyometric training						
DATE	13/7/17								
WARM UP	10 Star jumps	15 Sec jogging on the spot	15 Sec high knees	15 Sec side steps	10 walking lunges	10 side squats	10 Sec hamstring stretch	10 Sec triceps stretch	10 Sec quad stretch
EXERCISE	Squat Jumps	Scissor Jumps	Skater Jumps	Broad Jumps	REST	Burpees	Lateral box jumps (to the side)	Front box Jump	REST
SETS X REPS	3x10	3x10	3x10	3x10	30 SECS	3x5	3x20	3x10 /30cm	30 SECS
BORG RATING	16 – The first session was quite easy but still challenging. Due to me performing similar exercises through training at the gym, I started off with a more challenging intensity to suit my level. The exercises were performed very well, with box jumps being the hardest, probably due to me not performing as many plyometric exercises in my previous training at the gym.								
COOL DOWN	Quad stretch	Hamstring stretch	Calve stretch	Static lunges	Side lunges	Back stretch	Triceps stretch		

Session	2		Plyometric training						
DATE	20/7/17								
WARM UP	10 Star jumps	15 Sec jogging on the spot	15 Sec high knees	15 Sec side steps	10 walking lunges	10 Sec quad stretch	10 Sec hamstring stretch	10 Sec triceps stretch	10 Sec side leg stretch
EXERCISE	Squat Jumps	Press ups	Skater Jumps	Broad Jumps	REST	Burpees	Lateral box (to the side)	Front box Jump	REST
SETXREPS	3x10	3x8	3x10	3x10	30 SECS	3x5	3x20	3x10 /30cm	30 SECS
BORG RATING	16- The press ups were very easy and performed well, similar to the week before. I had more knowledge about the order of the exercises, so I didn't pause in-between sets to look at my training programme sheet. This meant the rest interval between exercises was less and it was a more efficient session.								
COOL DOWN	Quad stretch	Hamstring stretch	Calve stretch	Static lunges	Side lunges	Back stretch	Triceps stretch		

Session	3		Plyometric training						
DATE	27/7/17								
WARM UP	10 Star jumps	15 Sec jogging on the spot	15 Sec high knees	15 Sec side steps	10 walking lunges	10 Sec quad stretch	10 Sec hamstring stretch	10 Sec triceps stretch	10 Sec side leg stretch
EXERCISE	Squat Jumps	Scissor Jumps	Mountain climbers	Press ups	REST	Burpees	Lateral box (to the side)	Front box Jump	REST
SETS X REPS	3x12	3x12	3x15	3x10	20 SECS	3x5	3x20	3x10 /35cm	30 SECS
BORG RATING	17- The press ups were more challenging as there were more arm exercises. My squat jump depth was improving, due to my flexibility and agility improving as the week's progress. The box jump height was challenging still, mainly because I'm not used to bounding quickly from a standing position.								
COOL DOWN	Quad stretch	Hamstring stretch	Calve stretch	Static lunges	Side lunges	Back stretch	Triceps stretch		

Session	4		Plyometric training						
DATE	3/8/17								
WARM UP	10 Star jumps	15 Sec jogging on the spot	15 Sec high knees	15 Sec side steps	10 walking lunges	10 Sec quad stretch	10 Sec hamstring stretch	10 Sec triceps stretch	10 Sec side leg stretch
EXERCISE	Squat Jumps	Scissor Jumps	Mountain climbers	Broad Jumps	REST	Press ups	Lateral box (to the side)	Front box Jump	REST
SETS X REPS	3x15	3x15	3x15	3x12	20 SECS	3x12	3x20	3x10 /35cm	30 SECS
BORG RATING	18- This session was more exhausting as I had little rest to recover (tension overload). This means higher amounts of tension creates greater hypertrophy, because the muscles are being stretched when they contract to the full length. Also, fast contractions will stimulate fast twitch muscle fibres at a much higher rate, and this is important when improving power.								
COOL DOWN	Quad stretch	Hamstring stretch	Calve stretch	Static lunges	Side lunges	Back stretch	Triceps stretch		

Session	5		Plyometric training						
DATE	10/8/17								
WARM UP	10 Star jumps	15 Sec jogging on the spot	15 Sec high knees	15 Sec side steps	10 walking lunges	10 Sec quad stretch	10 Sec hamstring stretch	10 Sec triceps stretch	10 Sec side leg stretch
EXERCISE	Squat Jumps	Press ups	Mountain climbers	Broad Jumps	REST	Burpees	Lateral box (to the side)	Front box Jump	REST
SETS X REPS	3x15	3x12	3x15	3x12	20 SECS	3x6	3x20	3x10 /35cm	20 SECS
BORG RATING	17- This was the best week yet, and I performed it very well and felt strong when performing the exercises. I was able to complete all explosive movements and not over-exert myself to the point where it is dangerous.								
COOL DOWN	Quad stretch	Hamstring stretch	Calve stretch	Static lunges	Side lunges	Back stretch	Triceps stretch		

Session	6		Plyometric training						
DATE	17/8/17								
WARM UP	10 Star jumps	15 Sec jogging on the spot	15 Sec high knees	15 Sec side steps	10 walking lunges	10 Sec quad stretch	10 Sec hamstring stretch	10 Sec triceps stretch	10 Sec side leg stretch
EXERCISE	Squat Jumps	Scissor Jumps	Skater Jumps	Press ups	REST	Burpees	Lateral box (to the side)	Front box Jump	REST
SETS X REPS	3x18	3x15	3x20	3x12	30 SECS	3x7	3x20	3x10 /38cm	20 SECS
BORG RATING	19- The box jumps were extremely hard. Due to muscular hypertrophy it is hard to lift the weight from the floor, and get the momentum to push from the floor. I also increased the intensity (increased the reps and height), which made the session more challenging.								
COOL DOWN	Quad stretch	Hamstring stretch	Calve stretch	Static lunges	Side lunges	Back stretch	Triceps stretch		

Session	7		Plyometric training						
DATE	17/8/17								
WARM UP	10 Star jumps	15 Sec jogging on the spot	15 Sec high knees	15 Sec side steps	10 walking lunges	10 Sec quad stretch	10 Sec hamstring stretch	10 Sec triceps stretch	10 Sec side leg stretch
EXERCISE	Squat Jumps	Press ups	Mountain climbers	Broad Jumps	REST	Burpees	Lateral box (to the side)	Front box Jump	REST
SETS X REPS	3x18	3x12	3x15	3x10	20 SECS	3x7	3x20	3x10 / 38cm	30 SECS
BORG RATING	19- My depth and flexibility in the squats were improving each week. The session was very difficult because I decreased the rest interval. Normally, the rest period should be from 30 to 60 seconds, and altogether my rest interval was 50, which is in the middle of that 'normal' time length.								
COOL DOWN	Quad stretch	Hamstring stretch	Calve stretch	Static lunges	Side lunges	Back stretch	Triceps stretch		

Session	8		Plyometric training						
DATE	24/8/17								
WARM UP	10 Star jumps	15 Sec jogging on the spot	15 Sec high knees	15 Sec side steps	10 walking lunges	10 Sec quad stretch	10 Sec hamstring stretch	10 Sec triceps stretch	10 Sec side leg stretch
EXERCISE	Squat Jumps	Scissor Jumps	Skater Jumps	Broad Jumps	REST	Burpees	Lateral box (to the side)	Front box Jump	REST
SETSEXREPS	3x18	3x15	3x20	3x12	15 SECS	3x7	3x20	3x10 /38cm	20 SECS
BORG RATING	19-Altogether, I had a rest period of 35 seconds, which is almost the minimum 'normal' rest time between rounds. This made my session very challenging as it was a big decrease from the rest time in the previous session.								
COOL DOWN	Quad stretch	Hamstring stretch	Calve stretch	Static lunges	Side lunges	Back stretch	Triceps stretch		

Session	9	Plyometric training							
DATE	31/8/17								
WARM UP	10 Star jumps	15 Sec jogging on the spot	15 Sec high knees	15 Sec side steps	10 walking lunges	10 Sec quad stretch	10 Sec hamstring stretch	10 Sec triceps stretch	10 Sec side leg stretch
EXERCISE	Mountain climbers	Scissor Jumps	Press ups	Broad Jumps	REST	Burpees	Lateral box (to the side)	Front box Jump	REST
SETS X REPS	3x18	3x12	3x14	3x12	15 SECS	3x7	3x20	3x10 /40cm	20 SECS
BORG RATING	20- I felt this session was the hardest yet, mainly due to the increased amount of explosive/jumpy movements. This meant that by the end of the round I was almost out of breath, meaning my box jumps were extremely challenging. I may have been over-fatigued due to the previous exercises, which meant the time between each reps were longer to recover.								
COOL DOWN	Quad stretch	Hamstring stretch	Calve stretch	Static lunges	Side lunges	Back stretch	Triceps stretch		

Session	10	Plyometric training							
DATE	7/9/17								
WARM UP	10 Star jumps	15 Sec jogging on the spot	15 Sec high knees	15 Sec side steps	10 walking lunges	10 Sec quad stretch	10 Sec hamstring stretch	10 Sec triceps stretch	10 Sec side leg stretch
EXERCISE	Squat Jumps	Press ups	Skater Jumps	Broad Jumps	REST	Burpees	Lateral box (to the side)	Front box Jump	REST
SETXREPS	3x18	3x14	3x20	3x10	NO REST	3x5	3x20	3x10 /40cm	30 SECS
BORG RATING	20- I decreased my rest time to the very minimum of 30 seconds. I had to take this session slowly and make sure I wasn't pushing myself to a dangerous limit. In all though, I completed all exercises, even if they were not as fast as I would've preferred.								
COOL DOWN	Quad stretch	Hamstring stretch	Calve stretch	Static lunges	Side lunges	Back stretch	Triceps stretch		

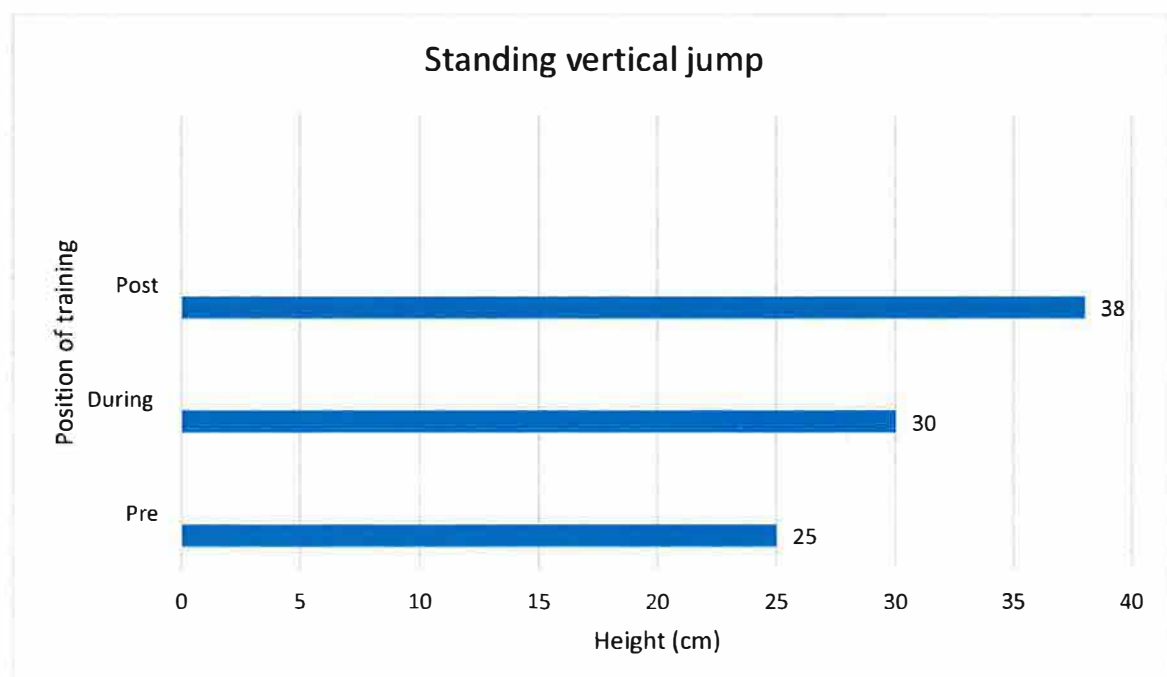
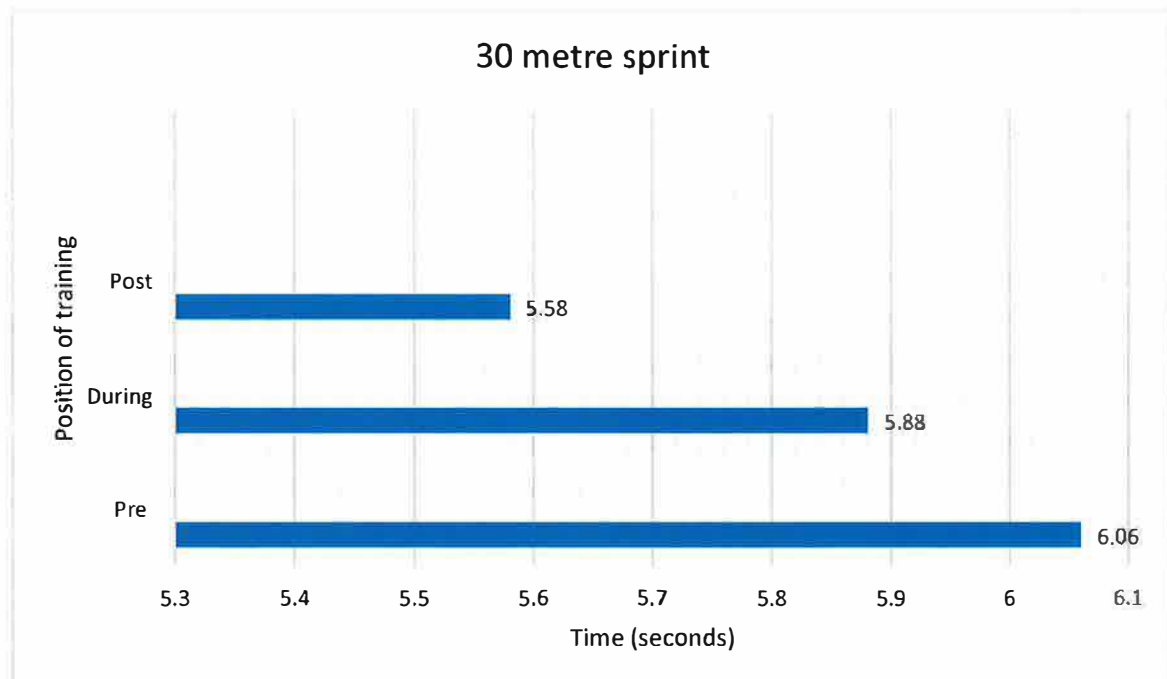
Session	11	Plyometric training							
DATE	14/9/17								
WARM UP	10 Star jumps	15 Sec jogging on the spot	15 Sec high knees	15 Sec side steps	10 walking lunges	10 Sec quad stretch	10 Sec hamstring stretch	10 Sec triceps stretch	10 Sec side leg stretch
EXERCISE	Squat Jumps	Scissor Jumps	Skater Jumps	Broad Jumps	REST	Burpees	Mountain climbers	Front box Jump	REST
SETS X REPS	3x18	3x12	3x20	3x10	NO REST	3x5	3x10	3x10 /40cm	30 SECS
BORG RATING	19- I changed up the exercises in this session so they were the most explosive/powerful. However, I decreased the reps for some exercises because I knew that it would've been too much if I kept them high. For my last session I would definitely push myself to the limit and increase the reps.								
COOL DOWN	Quad stretch	Hamstring stretch	Calve stretch	Static lunges	Side lunges	Back stretch	Triceps stretch		

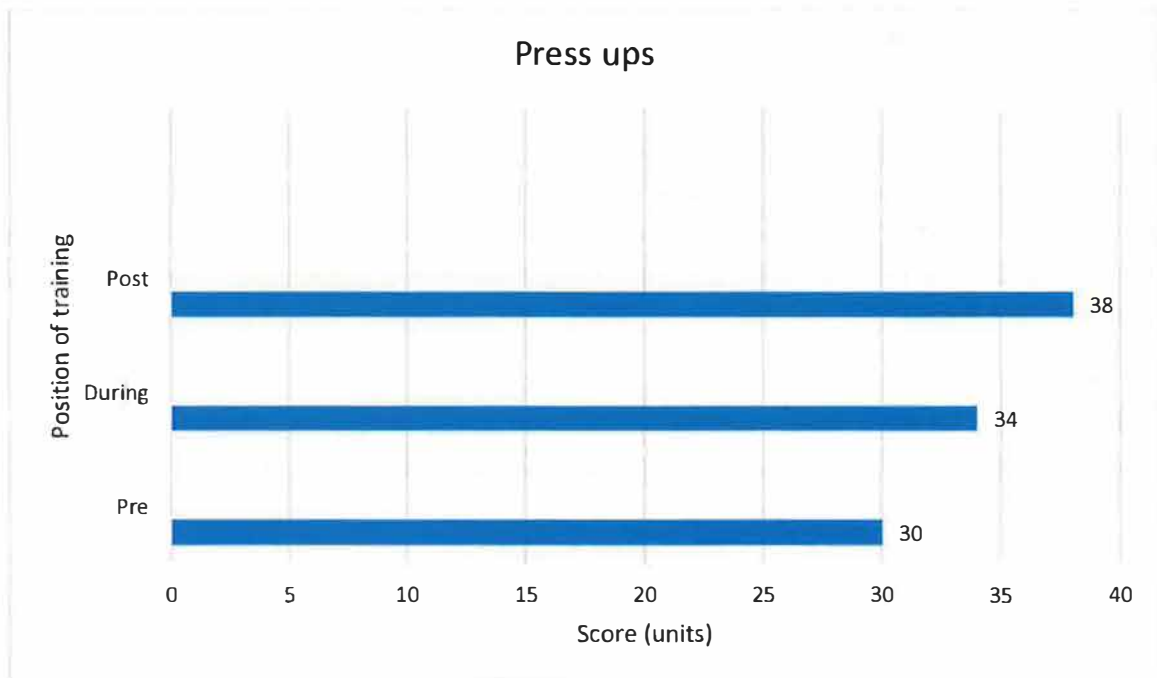
Session	12		Plyometric training						
DATE	21/9/17								
WARM UP	10 Star jumps	15 Sec jogging on the spot	15 Sec high knees	15 Sec side steps	10 walking lunges	10 Sec quad stretch	10 Sec hamstring stretch	10 Sec triceps stretch	10 Sec side leg stretch
EXERCISE	Squat Jumps	Scissor Jumps	Skater Jumps	Broad Jumps	REST	Burpees	Lateral box (to the side)	Front box Jump	REST
SETS X REPS	3x18	3x15	3x20	3x12	NO REST	3x8	3x20	3x10 /40cm	30 SECS
BORG RATING	20- This was my last session and definitely the toughest. I performed near enough the same exercises and the previous session but increased the reps. My technique for each exercise was almost perfect as I knew what to do, and my depth, flexibility and ROM was improved.								
COOL DOWN	Quad stretch	Hamstring stretch	Calve stretch	Static lunges	Side lunges	Back stretch	Triceps stretch		

Review and Evaluation

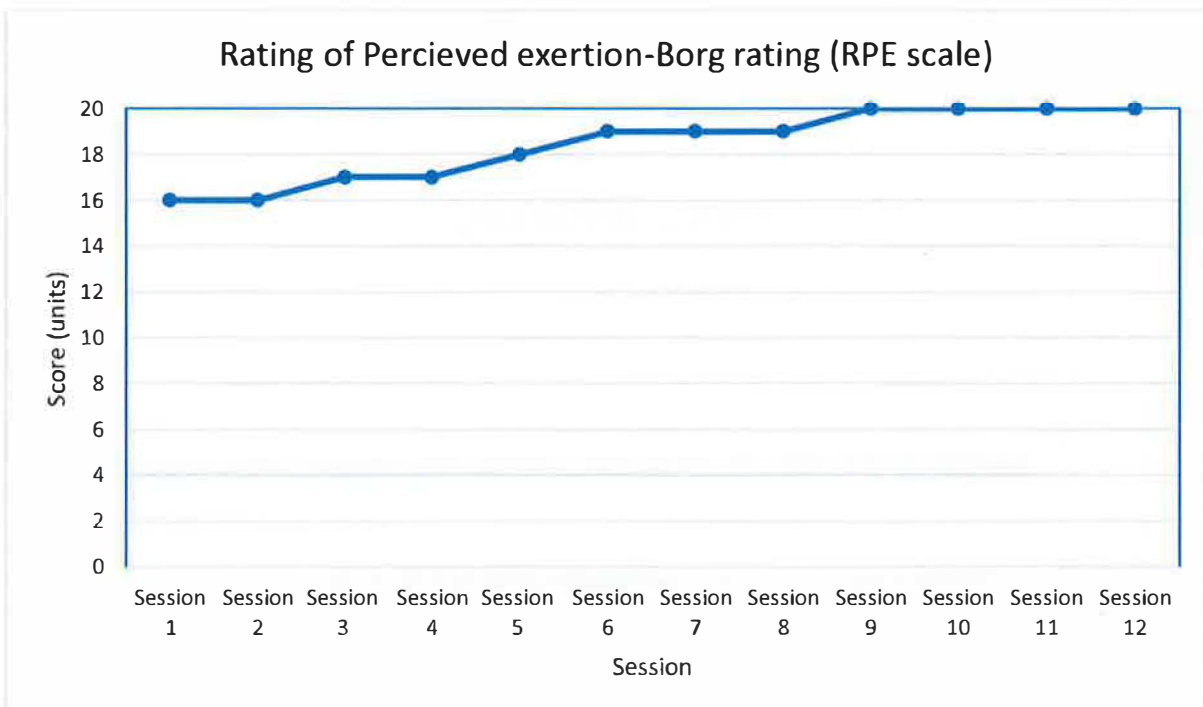
My 12-week training programme was developed to improve my power. By looking at my results, I had improved in all my fitness tests (standing vertical jump, press ups, 30 metre sprint). My main fitness test- the 30-metre sprint quickly improved from a score of from 6.06 to 5.88 seconds. This is useful in netball as you need to accelerate quickly to get into a clear space. I could react quicker (as my reaction time improved) when the person said go, which can be replicated to the sound of the whistle.

I also improved on my other tests- standing vertical jump and press ups. With combining both strength and speed tests, it improved my power, and increased neuromuscular speed.





For the first 5 weeks my Borg rating was consistent around 16-18. After my second week, my muscles had adapted to the initial exercises and were able to perform them quite well, despite being still quite challenging. I then increased the intensity and frequency of exercise in the third week. The press ups were more challenging (as the frequency of arm exercises increased), but still performed well. My squat depth was improving, even though the box jumps were challenging. In my fourth session, I found it was more exhausting as there was little time to recover (due to increasing the overload). My Borg rating had increased in the last 3 sessions, as so did the difficulty.



Due to me increasing the reps, intensity and volume each week (progressive overload), I could get physically stronger, and this showed in my fitness tests. My muscles were continually working harder than they're used to and I improved on my muscle mass, strength and endurance. My weight had increased from 54kg to 55kg. This could be due to muscular hypertrophy, and also the fact that I had increased the muscle fibre recruitment and force production. Furthermore, by using the progressive overload principle, it affected my anaerobic and cardiovascular system. By reducing the rest time, it enabled my body to become more metabolically efficient with regards to power because it essentially means doing the same amount of work in less time, improving my exercise economy. This meant my neuromuscular speed to stimuli improved. Also, by stressing the anaerobic system and using up fast-twitch muscle fibres, it meant that the lactic threshold could be delayed and my energy output increased on each exercise.

The positives to my 12-week training programme were it was a success, as I showed an improvement in my ability to accelerate and overall power output. I had a variation of exercises, reps and sets. This meant I didn't get bored of doing the same things and found each week fun but still challenging. The intensity was kept high with short intervals. This is important as in netball; anaerobic exercise such as sprinting is fuelled by fast twitch muscles fibres. My last sessions involved no rest periods, and even though this was very challenging, it pushed my body to the limit and I worked at intense levels.

One negative is that there could've been other factors that affect my physique. As well as performing plyometric exercises 1 day a week, I also weight lifted at the gym 5-6 times each week. Although this would've increased my strength, the fact that I gained weight could be from going to the gym and muscle hypertrophy. It is therefore hard to say if my improvement in power was from weight lifting, or my 12-week plyometric training program (or a combination of both). Another disadvantage is that my cool down was the same. Although I used basic stretches after my session that decreased the recovery time, I didn't change it up each week, which I could've done so it was more interesting.

If I was to do this training programme again, I would firstly increase the frequency of sessions per week. Due to me only performing plyometric exercises once a week it was hard to distinguish whether it was the source of me improving my power or not. If I were to do this again I would do plyometric exercises 2/3 times a week, and measure accurately my weight training through a set programme so I can track my improvements. Also, you need between 48 and 72 hours to recover after a plyometric workout to allow your muscles to repair themselves. With this being said, no more than 3 sessions per week will reduce the risk of injury, and make my movements even more powerful.

I would also increase the sets and decrease the reps so it is less intense. Although it pushed me to the limit and improved my power hugely, next time I would've put in 4 rounds to limit the amount of reps. According to research, the total number of reps a person performs depends on their height, weight, and training level. Due to me having a fair amount of muscle mass, it would've been better if I performed 3-8 sets of no more than 8 powerful and clean reps, and this would've increased muscle contraction speed greater. It would've also meant that I could add more volume into each exercise, as there is more time to recover the energy systems. This would've improved my performance because the reps would've been cleaner, fuller, and my jumps deeper and higher.

I would also change my cool down to make it more interesting and keep the muscles guessing as to which stretch I were to use.

Overall, I enjoyed doing my 12-week training programme and it improved my power. By using both strength and plyometric training, I could improve my neuromuscular reactions/speed. In netball, this is important because now I can sprint for the ball quicker and move from one position to the next. In all, my programme was a success and had a positive effect on my performance in netball.

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