

Coaching Programme

A1 – Planning

Week	Week Beginning	Timetable	Monitoring
1	December 31 st 2001	Come to a decision on two activities to examine. Swimming and Hurdles	Swimming activity – Front crawl Hurdles – Technique up to and over first hurdle
2	January 7 th 2002	Prepare data collection sheets for making note of the strengths and weaknesses performed	
3	January 14 th 2002	Observation of front crawl	
4	January 21 st 2002	Observation of hurdles	
5	January 28 th 2002	Identification of major strengths and weakness of both subjects	
6	February 4 th 2002	Select sport to be analysed	Selected swimmer
7	February 11 th 2002	Research physiological and psychological reasons as to why the performer shows these strengths and weaknesses.	
8	February 18 th 2002	Give an explanation using research to justify strengths and weaknesses. Choose area for further development	Chosen swimmer's conditioning ability to improve on
9	February 25 th 2002	Make plan to improve swimmers conditioning, subsequently improving performance.	Plan to make a swimming routine that will commence twice a week and will increase in load weekly
10	March 4 th 2002	Week one of training programme	
11	March 11 th 2002	Week two of training programme	
12	March 18 th 2002	Week three of training programme	
13	March 25 th 2002	Week four of training programme	
14	April 8 th 2002	Week five of training programme	
15	April 15 th 2002	Week six of training programme	
16	April 22 nd 2002	Week seven of training programme	
17	April 29 th 2002	Week eight of training programme	
18	May 6 th 2002	Conditioning retest	
19	May 13 th 2002	Produce an account on the intended procedure and method. Explain the desired outcome	

B1

Technique Sheet

Activity – Swimming Front Crawl

Using video evidence and a digital camera to record the performances, this is a description of the ideal technique in order to perform the stroke that will significantly reduce wasted energy output through less drag in the water and a cleaner execution of hand and arm entry and recovery.

- Lying flat in the water, feet level with your head, presents the least frontal resistance to your passage through the water. A 12 inch drop of your feet will almost double your frontal resistance or drag.
- Lifting the head is the most likely cause of your feet dropping. This is most likely to happen during breathing.
- Correct body roll moves the body profile from a square-on position into a 'pointed' position. It also allows the back muscles to be brought into play when completing the push phase of the stroke, which is the most powerful part of the stroke. It brings the head into a position to breathe.
- The catch is the front-end of the front crawl stroke. If done correctly, the catch will engage the hand early in the stroke, not only boosting pulling force, but also slowing the early part of the stroke thus allowing adequate time for the other arm to complete the powerful push phase. Done correctly the catch is characterised by the high-elbow position.
- Following entry, the lead arm and shoulder reach forward and then hold a glide position. Approximately one third of the time the hand is in the water is spent in this glide position.
- The front end of the strike is performed slowly and with little force being applied by the swimmer.
- The stroke accelerates as it moves toward the end, the hand reaching its peak speed just before the push phase is completed.
- The arm is never pulled directly backwards, but, instead is pulled under the body (but not crossing the centre line) and is pushed back outwards towards the rear of the stroke (the 'S' pull).

B1 - Technique Sheet

Activity – 110m Hurdles

Using video evidence and a digital camera to record the performances, this is a description of the ideal technique in order to perform the 110m hurdles in order to meet the technical components of hurdling that are clearly much greater than in sprinting, yet however the concept of the hurdles race must be one of a sprint, with adjustment for each hurdle. The stride pattern for sprint hurdling is a 7-8 stride pattern to the first hurdle followed by a 3 stride pattern between the hurdles.

- In sprint hurdling the first hurdle is only some seven or eight strides away so the athlete must come upright at the 3rd or 4th stride, much earlier than the sprinter. To enable this to happen the block spacing will have to be slightly altered. When using an eight stride approach the take-off foot is placed in the front block.
- The athlete must attack the hurdle and aim to clear it, by approx. 17-18 cm, as quickly and efficiently as possible, raising their centre of gravity only a little more than in a normal sprint action.
- The last stride of the approach to the first hurdle is shortened in order to allow the take-off leg to move rapidly under the hips. This ensures that a fast effective drive can be made across the hurdle.
- The knee must be picked up fast.
- The knee is driven at the hurdle.
- The lower part of the leg is left low and extends once the knee reaches the height of the barrier.
- The knee must be picked up in line with the vertical centre line of the body.
- There should be no tendency for the knee to be pulled across the body or for the lower leg to go out and round.
- As the heel of the lead leg passes the barrier it must be pulled down and back to land under the body.
- There is no necessity for the lead leg to be straight over the top of the hurdle.
- The leg straightens as it descends towards the ground.
- The last stride of the approach to the first hurdle is shortened in order to allow the take-off leg to move rapidly under the hips. This ensures that a fast effective drive can be made across the hurdle.
- As in sprinting, the arms act to balance the body and counter the rotations produced by the legs. The arm opposite to the lead leg actually leads the action into the hurdle and pushes/dives forwards as the lead leg rises. The other arm should be taken back in a normal sprinting action. As the trail leg comes round the leading arm swings back and wide to counter the rotation of the trail leg.
- Three strides are used to cover the ground between the hurdles. To achieve this the athlete has to modify his sprinting technique to make it fit the gap. A fast leg cadence and a shorter stride length is needed. The athlete may have to use a lower knee lift than in normal sprinting with an emphasis on leg speed. The correct range of movement and speed can be achieved by training over hurdles that are slightly closer together than normal.

C2 + C4

Activity – Front Crawl

Weaknesses

Here I will list the list the weaknesses that were recorded on my data collection sheet when the front crawl was being recorded:

- The right leg could be closer to the surface.
- It was not clear from the photo but the arm stretched out in front during the upsweep of the right arm it was to some extent away from the centre line to the front of him, which created a drag.
- As the head was turned sideways after the breath was taken the head was fully submerged when it should have peaked the water.
- The angle of the swimmer in the water had dropped slightly throughout the movement in proportion to the height he was in the water which made it difficult for the right arm to recover with the elbow exiting the water first.
- The photo showed his head to be hidden in the water when it should only be submerged up to the natural hairline.
- During the upsweep the leg action did not start at the hips like it should but it starts at the knee which resulted in the loss of power.
- To add to the in toeing effect the feet should have kicked up to the surface and churned the water up without splashing, the kick applied did not provide a sufficient force to support the arms.
- Usually there are six kicks in one stroke cycle although I would have to assume that the swimmer in question was a middle distance swimmer or long distance swimmer as he tended to kick less frequently at about four kicks per stroke cycle which would be less powerful.
- During the pitching of the hand the hand entered almost next to the other hand and not between the head and shoulder line. This was an example of over-reaching.
- As the left arm starts to pull and rolling the body like a log, it was clear from the photo that the left arm was very bent which is only used when the arms pull in an “S” pattern which was not apparent from the observations made.
- As the swimmers method of breathing did not require a breath for the recovery of the left arm, the head should not rotate along with the body. Instead the eyes always look straight down until the swimmer decides to breathe although this swimmer clearly turned his head despite not even taking a breath.

- The rolling like a log movement continued although the arm was not as straight as it should have been, the head should also have rotated with the body.
- The fingers were also spread which weakened the force applied from the whole arm movement.
- The hand should also have passed closer to the body although this could be put down to the flexibility of the swimmer.
- It was clear that the swimmer rotated too far (more than 45 degrees) which could have affected the propulsive force applied.
- The feet dropped too far below the body's depth altering the slope that should be kept, causing a resistance to the forward motion and causing problems with the rhythm of the breathing.
- The feet dropping also caused problems when the left arm as it went through the recovery stage because the whole arm would be so close to the surface of the water it would be difficult for the elbow to exit first and to keep it higher than the hand throughout.

The main weaknesses were the over rotation and the timing at which the sweeps were carried out in proportion to the opposite arms.

On the next pages I will explain these strengths and weaknesses with the use of photographs of a swimmer who performed the movement for me.

C1 + C3

Activity – 110m Hurdles

Strengths

Here I will list the list the strengths that were recorded on my data collection sheet when the hurdler was being recorded:

- Following the start, the athlete approached the hurdle with good sprinting style, hips high.
- The eighth step was slightly shorter so that the centre of mass was slightly ahead of the takeoff foot.
- The lead leg knee was picked up fast to lead and driven at the hurdle.
- The lead leg knee was picked up in line with the vertical centre line of the body accurately.
- The lead leg then folded at the knee correctly, whilst the trailing leg was still driving the hurdler forwards into an active take off.
- The left arm (the arm opposite the lead leg) was very active, whilst the right arm did very little (sleeps).
- The trailing leg drove the body at the hurdle as the lead leg was raised. As the lead knee and thigh drove upwards, the trunk dipped accurately.
- The athletes thought of the trail leg knee, pulling the foot through vigorously.
- As soon as the lead foot passed the hurdle, it began its fast descent to the ground. During this phase the trail leg was moving quickly assisted by the left arm driving back.
- As the heel of the lead leg passed the barrier it was pulled down and back to land under the body.
- As the trailing leg crossed the hurdle the foot was cocked at the ankle so that the foot did not hit the barrier.
- The right arm becomes more active as the athlete left the hurdle. As soon as the lead foot passed the hurdle, it began its fast descent to the ground. During this phase the trail leg was moving quickly assisted by the left arm driving back.

- After crossing the barrier the trailing knee continued to rise and comes round in front of the body.
- As the athlete reached the ground with the lead leg, sprinting is resumed.
- The hips did not sink as the athlete lands. The photo showed an excellent return to sprinting form, with active arms.

Overall the athlete performed the hurdle very efficiently and neatly.

C1 + C3

Activity – 110m Hurdles

Weaknesses

Here I will list the list the weaknesses that were recorded on my data collection sheet when the hurdler was being recorded:

- There was some tendency from the athlete to pull the lead leg knee across the body to be pulled across the body for the lower leg to go out and round.
- There was no necessity for the athletes lead leg to be straight over the top of the hurdle.
- It was clear from this observation that the athlete was slightly too high over the hurdle which I feel was due to the lead leg not being folded tightly until the thigh is parallel or above.
- The lead leg should have straightened as the trailing leg crossed the hurdle as opposed to before when it descended towards the ground.
- The trail leg was left quite wide by the athlete which should have been more tightly tucked in until touchdown. The trail leg is often left opened too prematurely, causing a loss of balance and speed.

The main weakness was coming too high over the hurdle which would have caused a loss of momentum and speed.

On the next pages I will explain these strengths and weaknesses with the use of photographs of a hurdler who performed the movement for me.

C2 +C4 Observation

Activity - Swimming Front Crawl

The following nine photographs show the phases of a full freestyle cycle with images and text that constructively point out adjustments that were not correct

The aim is to glide in the water and to swim as fast or faster with less strokes per length.



The swimmer has almost perfect balance in the water, swimming on his left with the trailing right exposed almost horizontally. The right leg could be closer to the surface. Only his face looked outside for breathing and the left arm was stretched out in front correctly. It was not clear from the photo but the arm stretched out in front during the upsweep of the right arm it was to some extent away from the centre line to the front of him, which created a drag.



The body position does not remain static throughout the movement, but rolls about 45 degrees around the longitudinal axis and the head does not deviate from the mid-line position when the breath is taken. As the head was turned sideways after the breath was taken the head was fully submerged when it should have peaked the water. The next step was to look down to the bottom of the pool. At this stage the swimmer applied explosive breathing correctly.



Whilst the swimmer looked at the bottom, there was no loss of balance. The body was stretched out horizontally with the right arm exposed. The angle of the swimmer in the water had dropped slightly throughout the movement in proportion to the height he was in the water which made it difficult for the right arm to recover with the elbow exiting the water first.

The photo showed his head to be hidden in the water when it should only be submerged up to the natural hairline.



The right arm to recovered, little finger first, looking down to the bottom of the pool, still balancing on the left side.

The movement was relaxed and he used the momentum from the upsweep. During the upsweep the leg action did not start at the hips like it should but it starts at the knee which resulted in the loss of power.



The recovery phase was perfectly balanced, long, relaxed, and slippery midway through the recovery.

The ankles were relaxed to allow the toes to point and to give a natural in toeing effect.

To add to the in toeing effect the feet should have kicked up to the surface and churned the water up without splashing, the kick applied did not provide a sufficient force to support the arms.



The powerful torso muscles were used correctly to initiate rolling from the left side to the right side as soon as the right hand was slipped into the water with the left arm starting to pull, rolling the body like a log.

During the in sweep of the left arm it was important to think about the distance between the chin and left shoulder and the swimmer did so correctly as the head started to rotate along with the body to breathe, and the chin was locked close to the shoulder.



As the left arm starts to pull and rolling the body like a log, it was clear from the photo that the left arm was very bent which is only used when the arms pull in an “S” pattern which was not apparent from the observations made.

As the swimmers method of breathing did not require a breath for the recovery of the left arm, the head should not rotate along with the body. Instead the eyes always look straight down until the swimmer decides to breathe although this swimmer clearly turned his head despite not even taking a breath.



The rolling like a log movement continued although the arm was not as straight as it should have been, the head should also have rotated with the body. The fingers were also spread which weakened the force applied from the whole arm movement. The hand should also have passed closer to the body although this could be put down to the flexibility of the swimmer.



The finish point is where the swimmer started on the left side although now on his right. It was clear that the swimmer rotated too far (more than 45 degrees) which could have affected the propulsive force applied. The feet also dropped too far below the body's depth altering the slope that should be kept, causing a resistance to the forward motion and causing problems with the rhythm of the breathing. The feet dropping also caused problems when the left arm as it went through the recovery stage because the whole arm would be so close to the surface of the water it would be difficult for the elbow to exit first and to keep it higher than the hand throughout.

C1 +C3 Observation

Activity – 110m Hurdles

All good sprint hurdlers must be fast sprinters. An efficient hurdle clearance technique is essential, but really fast times are produced through quick running between the hurdles.



Following the start, the athlete approached the hurdle with good sprinting style, hips high. The eighth step was slightly shorter so that the centre of mass was slightly ahead of the takeoff foot.



The lead leg knee was picked up fast to lead and driven at the hurdle. The lead leg knee was then picked up in line with the vertical centre line of the body.



There was some tendency from the athlete to pull the lead leg knee across the body to be pulled across the body for the lower leg to go out and round. The lead leg then folded at the knee correctly, whilst the trailing leg was still driving the hurdler forwards into an active take off.



The athlete did not "float" over the hurdle in this phase. The left arm (the arm opposite the lead leg) was very active, whilst the right arm did very little (sleeps). The trailing leg drove the body at the hurdle as the lead leg was raised. As the lead knee and thigh drove upwards, the trunk dipped, beginning the "lay out" over the hurdle.



The athletes pulled the foot through vigorously. As soon as the lead foot passed the hurdle, it began its fast descent to the ground. During this phase the trail leg was moving quickly assisted by the left arm driving back.



As the heel of the lead leg passed the barrier it was pulled down and back to land under the body. Despite what was performed by this athlete, there was no necessity for the athletes lead leg to be straight over the top of the hurdle.



The athlete allowed the trailing knee to sweep wide and flat over the hurdle. It was clear from this observation that the athlete was slightly too high over the hurdle which I feel was due to the lead leg not being folded tightly until the thigh is parallel or above.



As the trailing leg crossed the hurdle the foot was cocked at the ankle so that the foot did not hit the barrier. The lead leg should have straightened here as opposed to before as it descended towards the ground.



The right arm became more active as the athlete left the hurdle. As soon as the lead foot passed the hurdle, it began its fast descent to the ground. During this phase the trail leg was moving quickly assisted by the left arm driving back.



After crossing the barrier the trailing knee continues to rise and came round in front of the body. The trail leg was left quite wide by this athlete which should have been more tightly tucked in until touchdown. The trail leg is often left opened too prematurely, causing a loss of balance and speed.



As the athlete reached the ground with the lead leg, sprinting was resumed.



The hips did not sink as the athlete landed. This photo shows an excellent return to sprinting form, with active arms.

C2 + C4

Activity – Front Crawl

Strengths

Here I will list the list the strengths that were recorded on my data collection sheet when the front crawl was being recorded:

- The swimmer has almost perfect balance in the water, swimming on his left with the trailing right exposed almost horizontally. Only his face looked outside for breathing and the left arm was stretched out in front correctly.
- The body position does not remain static throughout the movement, but rolls about 45 degrees around the longitudinal axis and the head does not deviate from the mid-line position when the breath is taken. The next step was to look down to the bottom of the pool. At this stage the swimmer applied explosive breathing correctly.
- Whilst the swimmer looked at the bottom, there was no loss of balance. The body was stretched out horizontally with the right arm exposed.
- The right arm to recovered, little finger first, looking down to the bottom of the pool, still balancing on the left side. The movement was relaxed and he used the momentum from the upsweep.
- The recovery phase was perfectly balanced, long, relaxed, and slippery midway through the recovery. The ankles were relaxed to allow the toes to point and to give a natural in toeing effect.
- The powerful torso muscles were used correctly to initiate rolling from the left side to the right side as soon as the right hand was slipped into the water with the left arm starting to pull, rolling the body like a log.
- During the in sweep of the left arm it was important to think about the distance between the chin and left shoulder and the swimmer did so correctly as the head started to rotate along with the body to breathe, and the chin was locked close to the shoulder.
- His hand was pitched correctly with the palm facing half outwards for a clean, thumb-first entry.
- The finish point is where the swimmer started on the left side although now on his right.

With these important strengths the swimmer was able to perform these movements efficiently and effectively.

C2 + C4

Activity – Front Crawl

Weaknesses

Here I will list the list the weaknesses that were recorded on my data collection sheet when the front crawl was being recorded:

- The right leg could be closer to the surface.
- It was not clear from the photo but the arm stretched out in front during the upsweep of the right arm it was to some extent away from the centre line to the front of him, which created a drag.
- As the head was turned sideways after the breath was taken the head was fully submerged when it should have peaked the water.
- The angle of the swimmer in the water had dropped slightly throughout the movement in proportion to the height he was in the water which made it difficult for the right arm to recover with the elbow exiting the water first.
- The photo showed his head to be hidden in the water when it should only be submerged up to the natural hairline.
- During the upsweep the leg action did not start at the hips like it should but it starts at the knee which resulted in the loss of power.
- To add to the in toeing effect the feet should have kicked up to the surface and churned the water up without splashing, the kick applied did not provide a sufficient force to support the arms.
- Usually there are six kicks in one stroke cycle although I would have to assume that the swimmer in question was a middle distance swimmer or long distance swimmer as he tended to kick less frequently at about four kicks per stroke cycle which would be less powerful.
- During the pitching of the hand the hand entered almost next to the other hand and not between the head and shoulder line. This was an example of over-reaching.
- As the left arm starts to pull and rolling the body like a log, it was clear from the photo that the left arm was very bent which is only used when the arms pull in an “S” pattern which was not apparent from the observations made.
- As the swimmers method of breathing did not require a breath for the recovery of the left arm, the head should not rotate along with the body. Instead the eyes always look straight down until the swimmer decides to breathe although this swimmer clearly turned his head despite not even taking a breath.

- The rolling like a log movement continued although the arm was not as straight as it should have been, the head should also have rotated with the body.
- The fingers were also spread which weakened the force applied from the whole arm movement.
- The hand should also have passed closer to the body although this could be put down to the flexibility of the swimmer.
- It was clear that the swimmer rotated too far (more than 45 degrees) which could have affected the propulsive force applied.
- The feet dropped too far below the body's depth altering the slope that should be kept, causing a resistance to the forward motion and causing problems with the rhythm of the breathing.
- The feet dropping also caused problems when the left arm as it went through the recovery stage because the whole arm would be so close to the surface of the water it would be difficult for the elbow to exit first and to keep it higher than the hand throughout.

The main weaknesses were the over rotation and the timing at which the sweeps were carried out in proportion to the opposite arms.

On the next pages I will explain these strengths and weaknesses with the use of photographs of a swimmer who performed the movement for me.

C1 + C3

Activity – 110m Hurdles

Strengths

Here I will list the list the strengths that were recorded on my data collection sheet when the hurdler was being recorded:

- Following the start, the athlete approached the hurdle with good sprinting style, hips high.
- The eighth step was slightly shorter so that the centre of mass was slightly ahead of the takeoff foot.
- The lead leg knee was picked up fast to lead and driven at the hurdle.
- The lead leg knee was picked up in line with the vertical centre line of the body accurately.
- The lead leg then folded at the knee correctly, whilst the trailing leg was still driving the hurdler forwards into an active take off.
- The left arm (the arm opposite the lead leg) was very active, whilst the right arm did very little (sleeps).
- The trailing leg drove the body at the hurdle as the lead leg was raised. As the lead knee and thigh drove upwards, the trunk dipped accurately.
- The athletes thought of the trail leg knee, pulling the foot through vigorously.
- As soon as the lead foot passed the hurdle, it began its fast descent to the ground. During this phase the trail leg was moving quickly assisted by the left arm driving back.
- As the heel of the lead leg passed the barrier it was pulled down and back to land under the body.
- As the trailing leg crossed the hurdle the foot was cocked at the ankle so that the foot did not hit the barrier.
- The right arm becomes more active as the athlete left the hurdle. As soon as the lead foot passed the hurdle, it began its fast descent to the ground. During this phase the trail leg was moving quickly assisted by the left arm driving back.

- After crossing the barrier the trailing knee continued to rise and comes round in front of the body.
- As the athlete reached the ground with the lead leg, sprinting is resumed.
- The hips did not sink as the athlete lands. The photo showed an excellent return to sprinting form, with active arms.

Overall the athlete performed the hurdle very efficiently and neatly.

C1 + C3

Activity – 110m Hurdles

Weaknesses

Here I will list the list the weaknesses that were recorded on my data collection sheet when the hurdler was being recorded:

- There was some tendency from the athlete to pull the lead leg knee across the body to be pulled across the body for the lower leg to go out and round.
- There was no necessity for the athletes lead leg to be straight over the top of the hurdle.
- It was clear from this observation that the athlete was slightly too high over the hurdle which I feel was due to the lead leg not being folded tightly until the thigh is parallel or above.
- The lead leg should have straightened as the trailing leg crossed the hurdle as opposed to before when it descended towards the ground.
- The trail leg was left quite wide by the athlete which should have been more tightly tucked in until touchdown. The trail leg is often left opened too prematurely, causing a loss of balance and speed.

The main weakness was coming too high over the hurdle which would have caused a loss of momentum and speed.

On the next pages I will explain these strengths and weaknesses with the use of photographs of a hurdler who performed the movement for me.

D1

I have chosen to evaluate the qualities of the swimmer I have previously observed in comparison with a stronger and weaker performer of the same stroke. The skills of these three performers in total ranged from cognitive to autonomous. The swimmer I previously observed is in the associative stage will be referred to as swimmer A.

Swimmer A has been regularly attending swimming lessons on a weekly basis for the last two months. His instructor is qualified as a swimming coach and fitness instructor and has reached the autonomous stage, he will be referred to as swimmer B. He has not been able to improve for a long period of time as he is near perfection whereas swimmer is improving considerably. When comparing the two swimmers it becomes clear that swimmer A is making many mistakes although when comparing him to one swimmer B's other learners who is still in the cognitive learning stage, swimmer C, it makes swimmer A's mistakes seem very minimal.

I compared the three swimmers with two other swimmers who were both learning from swimmer B's lessons and put them into an order of ability, using the number of mistakes as a means of scoring. Swimmer B obviously made the least with only two mistakes made whilst swimmer A made the second fewest with sixteen visible mistakes recorded. Swimmer C made over thirty mistakes due to his lack of experience as he is still in the cognitive learning stage.

Despite subject A making sixteen mistakes throughout the movement he displayed many strengths that were not apparent with swimmer C that made the whole movement relatively efficient. Swimmer A had almost perfect balance in the water, when swimming on his left with the trailing right exposed almost horizontally which matched the performance of swimmer B although swimmer B was able to maintain this balance throughout the whole movement on both sides which swimmer A could not. Swimmer C however showed little sign of balance on either side.

Usually there are six kicks in one stroke cycle although I would have to assume that the swimmer A was either a middle distance swimmer, a long distance swimmer and was therefore conserving energy or was concentrating hard on breathing due to the lack of experience. By kicking less frequently at about four kicks per stroke cycle there was less power in comparison with swimmer B who was doing six kicks per stroke cycle who did not need to conserve his energy as much and needed to breathe less.

It was clear that swimmer A rotated too far (more than 45 degrees) during the recovery of the left arm which had affected the propulsive force applied. Swimmer B showed much greater strength in this area with perfect balance and rotation during the recovery of the left arm. Subject C was breathing on both side continuously and was therefore very prone over rotation. This over rotation was very easily observed when looking at subject C as the whole movement was not as smooth and more rigid. Again when comparing all three performers, swimmer A's ability in the area of rotation was far closer to swimmer B's performance as opposed to swimmer C's.

D2

These are the main reasons to explain why subject A had many strengths with regards to their performance of the front crawl.

As mentioned previously from my observations it is clear that swimmer A is at the associative stage of learning and that the instructor swimmer B has reached the autonomous stage of swimming. The associative stage is the intermediate stage where the performer corrects gross errors, develops motor programmes, works on the timing and smoothness of the movement and when the performer is refining the movement from feedback to adjust. Feedback is very important at this stage because the performer is continually adjusting. The reason why swimmer B has adapted his swimming technique so much to gain all the strengths of the movement previously listed is because of the skills he is working with and the feedback gained from swimmer B (the trainer) who has been swimming, demonstrating and coaching swimmers all his life. His feedback to swimmer A is both intrinsic and extrinsic. During my observation of swimmer A, swimmer B gave very little extrinsic feedback so he had to use his subconscious intrinsic feedback to improve.

It was clearly observable that swimmer A was of a far higher level of skill than swimmer C as he is more experienced and attends lessons regularly. By training regularly like swimmer A does skills like co-ordination and concentration can be worked upon. Co-ordination and concentration are essential in swimming in order to be able to perform the complete movement smoothly, fluently and efficiently. By improving these areas then speed and fitness are more easily worked upon.

The efficiency to which swimmer A swims appears to be very good as he is able to keep up the movement continuously for a reasonable amount of time although the speed was quite reasonable. Because of this ability I would find it necessary for the swimmer to train with six kicks per stroke cycle as opposed to four like I observed in the observations. The swimmers ability would suggest to me that he had a higher level of type 2a fast twitch muscle fibres. These are also referred to as fast oxidative glycolytic fibres (F.O.G.) which pick up certain type one characteristics through endurance training. Through the endurance training swimmer A has been carrying out he has supported a good resistance to fatigue which is why he is good at the distance he has been generally training at, which was 200m. This distance suited him well as it is a fairly high intensity and quite short in duration.

One factor that may have affected the speed at which swimmer A was performing the movement could be described through the theory of social facilitation as he had never swam in front of an observer like myself before. He may have however not been aware of these affects. In a sporting context the presence of others is usually referred to as the audience although the presence of others does come in different forms like myself and the trainer. My presence may have influenced swimmer A's efforts as though he was in a competition. Zajonc proposed that the presence of others raised the level of arousal of the performer. Arousal increases a performers drive, which is why the presence of others can enhance the performance of swimmer A's speed which is a simple task but have a negative effect on poorly-learned skills which required accuracy like balance and co-ordination of sweeps in the water.

D3

These are the reasons why swimmer had weaknesses he had in the front crawl.

Swimmer A's major weaknesses were mainly down to his lack of any real experience, his conditioning and fitness and his mental preparation.

Swimmer A has only been taking lessons now for the last two months but has been swimming casually all his life. Before his first lesson he had many bad techniques that had become natural to him and are therefore very hard to lose. Some of the previous bad habits are improving but are not yet perfect. Other bad techniques have shown little improvements over the two month period and are therefore the more difficult ones to correct.

Swimmer A is a reasonably fit individual who is an almost exact build for swimming although his is probably not the best height possible. He is also not conditioned for swimming yet as he has been swimming properly only for a relatively short period of time. An example of how swimmer A has not yet been physiologically conditioned enough to perform the sport at a higher level is how swimmer A should have passed his hand closer to the body on the upstroke which I put down to his flexibility that could only be improved through time.

A cause that could accompany other reasons as to why there were weaknesses in swimmer A's front crawl would be how he is motivated intrinsically as he is striving inwardly and only using self determination to try to develop competence or excellence of performance. He has mastery orientation. This is apparent as he is paying for the instructor to teach him to improve his skills on a regular basis. The weaknesses he showed in the observations could have been the results from disruptions in 'flow experience' from either a limited mental attitude, being too relaxed and not controlling anxiety, not focusing on the specific aspects or not feeling physically ready.

D4

The two main areas that I could aim to improve to help swimmer A's weaknesses with the front crawl are:

Improve swimmer A's physical conditioning or fitness level for swimming the front crawl –

By improving the necessary components of fitness for swimming at the necessary levels swimmer A will be able to carry out the techniques that are new to him with greater ease that will speed up the pace of learning. More power will be able to be applied and a greater range of motion in terms of flexibility will be able to ensure a greater length of each stroke resulting in more speed. Improved fitness will also make balance in the water more easier making the stroke cycles again easier. According to Thorndike the performer must be physically and mentally capable to carry out a task before it can be performed. This was called the 'Law of Readiness'.

Improving swimmer A's technique of the front crawl in the water –

This would take a long period of time as swimmer A has been swimming with bad techniques his whole life and would therefore find it very difficult to drop these habits. Should swimmer A re-learn the techniques involved in the front crawl it would make the stroke easier for him to perform and could therefore be obtained through practise.

D5

I would suggest to swimmer A that the most appropriate area for development would be his current physical condition. By improving this he is then got the basis needed for being able to perform the front crawl movement correctly. Despite the fact that Swimmer A is a reasonably fit individual who is a very good build for swimming he has not been conditioned for swimming as he has been swimming properly only for a comparatively short period of time.

Improving his bad techniques straight away would be another possibility that he has acquired through a life time of casual swimming. However these have become very natural to him and would take a very long time to lose. Improving his condition or fitness would allow the technique learning process to be far easier.

By carrying out a range of fitness tasks for swimmer A his conditioning ability will allow him to learn the range of movements of any stroke in swimming at a faster rate.

All my conditioning tasks will be carries out in a swimming pool where I work as a lifeguard and therefore have free unlimited access to.

D6

To increase swimmer A's conditioning levels.

I will need to apply the principles of training to develop and training routine. The training programme will include a warm up, a cool down ,a recovery period and the FITT (Frequency, Intensity, Time and Type) in order to fully condition swimmer A to perform the front crawl.

Warm Up –

Time spent on warming up and warming down will improve the level of performance and accelerate the recovery process. The warm up and warm down is an essential part of both the training session.

Performance may be improved as an appropriate warm up will result Performance may be improved as an appropriate warm up will result in an:

- Increased speed of contraction and relaxation of warmed muscles
- Dynamic exercises reduce muscle stiffness

- Greater economy of movement because of lowered viscous resistance within warmed muscles
- Facilitated oxygen utilization by warmed muscles because haemoglobin releases oxygen more readily at higher muscle temperatures
- Facilitated nerve transmission and muscle metabolism at higher temperatures; a specific warm up can facilitate motor unit recruitment required in subsequent all out activity
- Increased blood flow through active tissues as local vascular beds dilate, increasing metabolism and muscle temperatures

Cool Down –

Static stretches are more appropriate to the warm down as they help muscles to relax and increase their range of movement.

Stretching the muscles during warm up and cool down at each training session will improve the muscle flexibility and movement coordination, consequently enhancing physical performance while preventing injuries. Each group of muscles should be stretched individually.

Performance may be improved through an appropriate cool down by:

- Keeping metabolic activity high
- Dilating capillaries so that oxygen can be flushed through the muscle tissue
- Removing and oxidising any lactic acid that remains
- Prevents blood pooling in the veins
- Limiting effects of DOMS (Delayed Onset of Muscle Soreness)

The cool down returns the body to it's pre-exercise state and so will be included in the conditioning programme.

Recovery period –

Recovery time is essential in order for the swimmer to recover in time for the next training session. This prevents exhaustion both physically and mentally and prevents injury.

Principles of FITT –

Frequency: Swimmer A will need to devote two days a week to training.

Intensity: Training with intensity is going to be one of the biggest challenges. The intensity should vary with the type of exercise being done. For muscular strength and endurance, intensity refers to the percentage of the maximum resistance that is used for a given exercise. At the end of a training session, the swimmer should feel exhausted. As fitness is increased, the intensity must increase.

Time: Like intensity, the time spent exercising depends on the type of exercise being done. At least 20-30 continuous minutes of intense exercise must be

used in order to improve cardio respiratory endurance. For muscular endurance and strength, exercise time equates to the number of metres of the pool being swam. Flexibility exercises or stretches should be held by the swimmer for varying times depending on the objective. To improve flexibility, it is best to do stretching during cool-down.

Type: Type refers to the kind of exercise performed. Focusing on the part of body needed to improve. To improve performance, the swimmer should practice the particular skill wanted to improve.

Types of training:

Circuit Training –

A swimming devised circuit training programme would be an excellent way to simultaneously the speed and strength needed to perform the front crawl at a high level. The circuit training format makes use of a group of 6 to 10 strength exercises that are completed one exercise after another. Each exercise is performed for a specified number of repetitions or for a set time period before moving on to the next exercise. The exercises within each circuit are separated by brief, timed rest intervals, and each circuit is separated by a longer rest period. The total number of circuits performed during a training session would vary from two to six depending on the current level of fitness of the swimmer.

Interval Training –

This can be used for both aerobic and anaerobic training. It involves periods of work mixed with periods of recovery. The variables of the exercises would involve the distance of the interval, the intensity of the interval the length of the recovery period and the amount of intervals. The variations of all these variables depends on the areas the swimmer needs to improve.

From considering the differences in benefits and convenience of circuit training and interval training, I would consider it most appropriate to carry out interval training exercises on swimmer A. The sessions shall commence twice a week for eight weeks. I will be increasing the intensity every two training sessions.

In order to gauge the improvements in fitness I will measure swimmer A's fitness levels at the beginning and at the end of the eight week period. To assist me with the conditioning tests will be swimmer B (the trainer). By having the trainer assisting me there is less chance of any false results through bad judgement.

E1 + E2

Method

After completing conditioning tests I have recorded an interval training session for the next eight weeks to be completed every Tuesday and Friday evening of the week. The results of the fitness tests will be used to compare improvements after the eight week period.

Swimmer A will carry out a warm up at the start of each session that will vary according to the type of exercises to come.

The assistance of swimmer A's trainer will be valued as the pool is of a size where it is hard to observe the swimmer from one end, so by having myself and the trainer at each end the scope of vision is much greater.

The intensity will be increased after every two sessions (once a week). Each week I am adding 50m to the overall routine so each routine will be completed once on a Tuesday and again on the Friday and by the following Tuesday again the routine shall be 50m longer. I have tried to vary the sessions as much as possible to avoid boredom which could affect the ability to perform.

The sessions all consist of a warm up which is a steady straight swim. There is then a variation of different strokes to be performed which is aimed to improve a mass variety of areas of fitness. There is then the main part of the session which aims to improve vastly on the swimmers fitness as the techniques are far simpler but are performed at a greater pace. Finally there is a cool down consisting of a simple slow paced swim.

full	full stroke front crawl
pull	front crawl arms only, pulling buoy between legs
kick	front crawl legs only, maybe using kick board
kick on side (KOS)	rolling the body into the normal breathing position and then kicking for 6 beats. Rolling the body through to breathe on the other side and kicking for 6 beats.
fist	swimming with hands closed into fists. Fist/Full is a length of fist followed by a length of full stroke and helps highlight the feel of the water on the hands.
alternating one arm	starting with the left arm. The right arm is held out in front. Doing three complete strokes with the left arm then leaving the left arm in front and doing three strokes with the right.
catch-up	starting with the left arm, the right arm is held out in front and only begins its stroke when the left hand touches the right. Left arm now waits for the right arm to catch up and so on...
ripple	during the arm recovery the fingers are trailed (rippled) across the surface of the water. This only works on a high elbow and promotes a good roll.
front scull	swim just the front part of the stroke, hands stay underwater
back scull	swim just the back part of the stroke, hands stay underwater
full scull	swim the whole stroke, hands stay underwater
repeat	repeating set

Set A: 100 full, 50 pull, 25 kick - repeat after 30 seconds rest (350m)

Set B: 50 full, 25 kick, 50 pull, 25 kick - repeat after 30 seconds rest (300m)

Set C: 100 full, 50 kick on back, 100 pull, 50 kick on front (300m)

Set D: 150 full - repeat after 30 seconds rest (300m)

Over the next eight weeks the swims will be tailored to provide a comparatively high level of intensity (to improve overall fitness).

Week 1 - 700m

Warm-up: Set A (350m)

Strokes: 25m alternate 1-arm, 25m catch-up, 50 full, 50 full (30 seconds rest) 25m fist, 25m alternate 1-arm, 50 full (250m)

Main: 50 full, 25 pull, 25 full at 1,500m pace with 10 seconds rest intervals (100m)

Warm-down: easy swim to complete the session

Week 2 - 750m

Warm-up: Set A (300m)

Strokes: 25 catch-up, 25 full, 25 ripple, 25 full, 25 fist, 50 full (30 seconds rest) 25 ripple, 25 alternate 1-arm, 25 full, 25 fist, 25 full (300m)

Main: 50 full, 50 pull, 50 full at 1,500m pace with 10 seconds rest intervals (150m)

Warm-down: easy swim to complete the session

Week 3 - 800m

Warm-up: Set B (250m)

Strokes: 25 alternate 1-arm, 50 full, 25 catch-up, 50 full, 25 ripple, 50 full (30 seconds rest) 25 fist, 50m full, 25 alternate 1-arm, 50 full, 25 catch-up, 50 full (450m)

Main: 50 full, 75 pull, 100 full, 75 pull, 50 full at 1,500m pace with 10 seconds rest intervals (350m)

Warm-down: easy swim to complete the session

Week 4 - 850m

Warm-up: Set B (350m)

Strokes: 25 drill of choice, 25 full (count), 25 full (decrease by 2) rest 20 seconds and repeat 3 times (250m)

Main: 50 full, 50 pull, 100 full at 1,500 m pace with 10 seconds rest intervals (250m)

Warm-down: easy swim to complete the session

Week 5 - 900m

Warm-up: Set B (300m)

Strokes: 25 alternate 1-arm, 50 full, 25 catch-up, 50 full, 25 ripple, 50 full (30 seconds rest) 25 fist, 25m full, 25 alternate 1-arm, 25 full, 25 catch-up, 25 full (375m)

Main: 125 full, 100 full, 50 full at 1,500m pace with 10 seconds rest intervals (225m)

Warm-down: easy swim to complete the session

Week 6 - 950m

Warm-up: Set C (300m)

Strokes: 25 front-scutt, 25 full, 25 back-scutt, 25 full, 25 full-scutt, 50 full (30 seconds rest) 25 fist, 25m full, 25 alternate 1-arm, 25 full, 25 catch-up, 50 full (350m)

Main: 150 full, 100 full, 50 full at 1,500m pace with 10 seconds rest intervals (300m)

Warm-down: easy swim to complete the session

Week 7 - 1000m

Warm-up: Set C (300m)

Strokes: 25 front-scutt, 25 full, 25 back-scutt, 50 full, 25 full-scutt, 25 full (30 seconds rest) 25 ripple, 25m full, 25 fist, 50 full, 25 ripple, 25 full (350m)

Main: 25 full, 50 pull, 100 full, 50 p ull, 25 full at 1,500m pace with 10 seconds rest intervals (250m)

Warm-down: easy swim to complete the session

Week 8 - 1,050m

Warm-up: Set D (300m)

Strokes: 25 alternate 1-arm, 25 full, 25 catch-up, 50 full, 25 ripple, 50 full (200m)

Main: 500m timed swim

Warm-down: easy swim to complete the session

Each session should be performed to the best of the swimmers ability throughout each session. A recovery period of a couple of minutes will be allowed between the warm-up, the variations of strokes and the main part of the session.

After the eight week period has commenced, the swimmer will be re-tested in the same way that he was tested previously to measure the improvements made.

E3

The interval training routine I have devised would without doubt bring about an outcome which would assist the process of becoming a more efficient and effective swimmer in the front crawl. Here are some of the physiological benefits that occur:

- Maintains, tones, and strengthens the muscles as well as increasing the muscular endurance needed for swimming.
- Decreases your blood pressure.
- Increases the oxidation (breakdown and use) of fat.

- Increased aerobic capacity (fitness level), giving the ability to go through the front crawl movement with less relative energy expenditure.
- Increases HDL cholesterol.
- Increases the thickness of cartilage in joints which has a protective effect on the joints.
- Makes the heart a more efficient pump by increasing stroke volume.
- Increases haemoglobin concentration in blood.
- Increases the strength of the bones.
- Enlarges the arteries that supply blood to the heart.
- Decreases blood levels of triglycerides.

F1 + D7

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