

School of Sport, Health & Outdoor Education

Assessment Feedback Sheet**Student No./Name: 1702792 Sam Davies****Module: Aquatic Activities****Module Code: SHSS4075**

Personal Evaluation – to support your academic progress please complete the section below BEFORE submitting your work.										
What do you consider to be the best aspects of this work?	I found some good content and I referenced well									
Which aspects do you consider could have been improved in this piece of work?	Try to find more sources									
What have you found most satisfying whilst undertaking this submission?	My time management									
ASSESSMENT CRITERIA	Learning	GRADE								
		Poor < 20%	Weak 20-29%	Unsatisfactory 30-39%	Satisfactory 40 – 49%	Good 50 – 59%	Very Good 60 – 69%	Excellent 70 – 84%	Exceptional 85– 100%	%
Accuracy and relevance of content.40%	1									40%
General plan and structure of answer.40%	1									40%
Range of sources of information and referencing accuracy.20%	1									20%
It is expected that students will present work that is proof read and follows the School Reference Guide and Assessment Checklist . Therefore a range of 0 – 10 marks will be deducted for non-completion of any of the points on the checklist below .										

TUTOR COMMENTS:

Submission date:

January 11th 2019

via Turnitin

Return date:

(at least within 4 weeks)

Tutor: Karin Thomas

Mark:

“Water is 1000 times more dense than air, so when the body moves forward through it, the water resists its movement.”

Discuss the above statement in relation to ‘Front Crawl’ and ‘Breaststroke’ showing a sound understanding of the different types of resistance/drag, swimmers need to overcome.

Introduction

This essay will talk about the types of resistance or drag that swimmers will encounter when they enter the pool. It will then look more in depth at two very different strokes which are front crawl and breaststroke and the more specific types of resistance or drag that occur during these strokes. The types of resistance that this essay will talk about are frontal drag, wave drag and skin friction drag and it will discuss how these types of resistance occur. Drag can be defined as different movements that are performed by the swimmer and the amount of resistance that the water applies to those movements (Maglischo, 1993).

Types of resistance in front crawl

When humans take to the water, swimming performance is quite poor when you compare it to those species who have aquatic habitats and this is because humans experience very high levels of resistance when travelling through water (Touissant et al, 2004). Humans need to apply very large propulsive movements to pass through the water however, these movements are likely to increase resistance (Touissant et al, 2004).

While swimming front crawl, Bullock (in Murphy, 2008) explains that the body needs to be flat and must be parallel to the surface. He also says that a swimmer will encounter frontal resistance if you are not flat, for example, your legs being too low in the water which in turn, will reduce your speed. Bullock (in Murphy, 2008) also states that the main cause for this to happen to a swimmer is because they are holding their head too high, resulting in poor streamlining. As well as remaining flat to reduce drag, it is essential for swimmers to rotate during front crawl as this can also reduce frontal resistance and allows the swimmer to have an extended reach (Murphy, 2008). This is backed up by some experts, Maglischo (1993) states, who believe that rolling does indeed reduce frontal resistance as they spend more time on their sides therefore taking up less space in the water. However, (Maglischo, 1993) does actually disagree with this and explains how he believes that when the body is on the side, it will produce the same, possibly more, frontal resistance than when the body is horizontal. There have been studies where resistance has been measured and it found that it was greater when participants were towed on their sides as opposed to being towed horizontally (Maglischo, 1993)

It is essential that swimmers aim to take up as small a space as possible while in the water and this can be done by staying as horizontal as they possibly can to reduce frontal resistance (Maglischo, 1993). In order for swimmers to make it easier for themselves, they must not make the mistake of hydroplaning through the water which is when you arch your back and bring your head up and out of the water. This would then mean that the swimmer would need a harder and deeper kick to keep up their speed and to minimise frontal resistance (Maglischo, 1993). When it comes to kicking, swimmers have to be careful of not kicking too deep so that they take up too much space in the water but they also need to kick deep enough to move the body through the water (Maglischo, 1993).

Frontal resistance can be increased in front crawl by poor lateral motions such as movements from the legs and hips to spaces that they are not supposed to go which will cause the swimmer to encounter more water than they should (Maglischo, 1993). If a swimmer has poor lateral alignment, your body may pass through the water in a ‘wiggling or snaking motion’ (Maglischo, 1993, p. 52).

When swimming front crawl, swimmers do not have a problem with undulation, like breaststrokers do, as this is the process of moving up and down smoothly, but they can encounter problems when they start to lift and throw their heads from side to side (Maglischo, 1993). This will only unnecessarily increase wave drag. Maglischo (1993) states that front crawl swimmers should only roll side to side when they are breathing and even then, they should not lift their head from the water. It has been argued that the best stroke for minimal resistance is front crawl as it is a very streamlined stroke.

Types of resistance in breaststroke

When swimming breaststroke, swimmers will not stay horizontal as they need to make propulsive movements with their legs, such as the wide kick, to go forward. Therefore, there is more resistance to breaststroke swimmers than to front crawl swimmers (Maglischo, 1993). Another thing that Maglischo (1993) states that breaststrokers must be wary of is holding their hips too low and their heads too high as this will take up more space in the water therefore increasing frontal resistance. Frontal drag is extremely common in breaststroke and it has been argued that the way to overcome this type of drag is by being powerful and by perfecting the technique (Swim swam, 2018).

Wave drag, also known as pushing drag, involves the law which is Newton's action-reaction law, which can be defined as, 'to every action there is always opposed an equal reaction' (Sharma, 2017, p. 2). However, this law works against swimmers because they push water in different directions such as forward or to the sides and when this happens the counterforces can force the body to go in another direction (Maglischo, 1993). A common way in which breaststrokers can produce wave drag is when they push their arms and legs strongly against the water, for example, when they are stretching during arm recovery, swimmers may push some water forward with their hands or arms (Maglischo, 1993). The body then may not progress forward as quickly as the backward counterforce would have nullified the propulsion produced from the kick and this is why it is essential that swimmers move their arms forward calmly and in a streamlined manner (Maglischo, 1993). Another way that wave drag is produced by breaststrokers unnecessarily is when up and down movements of the body are exaggerated and there is more undulation than needed. Undulation to a certain extent is warranted for in breaststroke, however breaststrokers need to be careful that they are not excessive as they will be slowed down and resistance will be increased (Maglischo, 1993).

Murphy (2008) talks about how bad technique increases drag. An example of this bad technique is swimming with your head out of the water during breaststroke. Murphy (2008) also states that this will ultimately slow swimmers down and increase stress on your joints. An example that is given is if you swim with your head above the water, the neck will be compressed which in turn has detrimental effect on the swimmers back (Murphy, 2008).

Types of resistance in both strokes

Swimmers can generate propulsion through their arms and legs, dependent on which stroke they are doing. The larger the propulsion that the swimmer applies, the faster that they will move through the water, however, the swimmer must be able to deal with large resistive forces that will be applied from the water (Gatta et al, 2016). A way that resistance can be reduced is by the swimmer reducing the time that they spend in the turning and stroking phases as this will allow the swimmer more time to glide underwater. Therefore, to improve swimming performance, resistance has to be reduced and this can be done by improving technique through training or by just working on body position (Gatta et al, 2016).

However, another type of drag that can occur in swimming is skin friction drag which is when the water molecules come into contact with the body and slow you down (Maglischo, 1993). One way to overcome this would be to wear rubber swimsuits as this reduces the amount of contact that your skin has with the water and will allow the swimmer to reach higher speeds (Gatta et al, 2016). Some swimwear companies have now manufactured certain fabrics which dramatically reduce the amount of water molecules that pass over the suit therefore allowing for higher speeds (Touissant et al, 2002).

Some swimmers will choose special swim caps that fit their head perfectly and this will reduce drag as your hair will be covered and most athletes will shave down before crucial competitions to increase speed and reduce drag as much as they can (Maglischo, 1993).

Conclusion

There are many types of resistance when it comes to swimming. As this essay has talked about, human swimming performance is quite poor due to our nature and therefore humans experience large amounts of resistance. Front crawl is the most efficient stroke and experiences the least amount of resistance as it is so streamlined. However, it does experience frontal drag if the swimmer does not stay flat to the water surface. Breaststroke swimmers experience more resistance than front crawl swimmers due to its wide and not very streamlined manner. They experience frontal drag even if the technique is perfect as it requires a wide nature and it can also suffer from wave drag if not performed correctly. Both strokes experience skin friction drag but there are ways to minimise this such as shaving down and wearing appropriate swimsuits. There is no way of eliminating resistance in the water but if swimmers can apply the correct technique, wear the appropriate swimwear and shave down then they give themselves the best opportunity to reduce resistance and to be successful in the water.

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