Institution: Newman University

Unit of Assessment: 26: Sport and Exercise Sciences, Leisure and Tourism

Title of case study: Impact of research on intermittent exercise and training load monitoring

1. Summary of the impact (indicative maximum 100 words)

The Case Study focuses on the work of Ibrahim Akubat, an exercise physiologist lecturer who joined the department in 2010. Based on his research, Akubat has enabled a range of clubs to monitor accurately players' training loads and understand their footballers' training outcomes. Akubat's research shows the superiority of the new individualised training load monitoring method over existing methods of monitoring internal training load and exercise dose in intermittent sports. This has led to coaches from numerous professional clubs, including those from the English Premier League, attending workshops to seek guidance on modifying their approaches to training load monitoring.

2. Underpinning research (indicative maximum 500 words)

Akubat's research, which complements the 'Physiological, biomechanical and psychological aspects of sports performance' research team at Newman University, shows the superiority of a new method of monitoring internal training load (Individualised Training Impulse – iTRIMP) over methods that are still being used in research as criterion measures (Akubat, Barrett, Patel & Abt, 2012). Akubat identifies the limitations of those methods such as rating of perceived exertion (RPE), Edwards Training Impulse (TRIMP) & Banisters TRIMP in his publications. He also argues that the use of new technology such as GPS tracking devices cannot solely provide sufficient, appropriate and accurate information on the training load. This has led to his latest paper which shows the integration of iTRIMP and GPS measurements is better than just the use of GPS alone (Akubat, Barrett & Abt 2013).

Research into the calculation of training impulse (TRIMP) in team sport players following intermittent exercise concludes that the determination of TRIMP from the change in the Heart Rate to Blood Lactate relationship (derived from a continuous exercise protocol) may underestimate the exercise 'dose' of training and/or matches in team sport players (Akubat et al, 2011). As this underestimation is most prominent at the highest intensities, the absolute exercise intensity and/or the time spent at these high intensities should be lowered if a given TRIMP is to be achieved. Alternatively, if the absolute exercise intensity and/or time spent at these high intensities are maintained, then the actual 'dose' will be higher than that which is recorded. This might have implications for the development of injury or overtraining. Therefore the research advocates that this should be considered when monitoring player loads.

3. References to the research (indicative maximum of six references)

Abt, G., Siegler, J., Akubat, I. and Castagna, C. (2011) The effects of a constant sprint-to-rest ratio and recovery mode on repeated sprint performance. *Journal of Strength and Conditioning Research.* 25 (6): 1695-1702.

Akubat, I. and Abt, G. (2011) Intermittent exercise alters the heart rate-blood lactate relationship used for calculating the training impulse (TRIMP) in team sport players. *Journal of Science and Medicine in Sport.* 14 (3): 249-253.

Akubat, I., Patel, E., Barrett, S. and Abt, G. (2012) Methods of monitoring the training and match load and their relationship to changes in fitness in professional youth soccer players. *Journal of Sports Sciences*. 30 (14): 1473-1480.

Akubat, I., Barrett, S. and Abt, G. (2013) Integrating the internal and external training load in soccer. *International Journal of Sports Physiology and Performance*. (In Press).

4. Details of the impact (indicative maximum 750 words)

The study findings of Abt, Siegler, Akubat, and Castagna (2011) suggest that coaches and/or athletes will need to adapt training methods depending on the likely distance that athletes are required to regularly perform. This knowledge has proved to be valuable throughout the sport science field, contributing to incremental and cumulative advances in training methods.

Akubat and Abt (2011) suggest coaches and/or sports scientists will need to adjust their training load recommendations depending on whether the athlete is adopting a continuous or intermittent exercise. The research findings have implications for the development of injury or overtraining and should therefore be considered when monitoring player loads. The studies in 2012 and 2013 demonstrate the superiority of the iTRIMP method of monitoring training load with respect to previously established methods and how an integration of internal and external load could be used more effectively.

The publication of these papers has generated international interest. The research is impacting on practices at the highest level of competition in English football. Akubat is currently working directly with three professional football clubs in the UK (Coventry City FC, Stoke City FC and Crystal Palace FC) and a professional Rugby Super League team (Hull Kingston Rovers). He has also supported a team in Ghana (Red Bull Ghana FC) who contacted him for help implementing the iTRIMP method. Workshops held at Newman University and in conjunction with Bradford Bulls Rugby League FC that have been run by Akubat have been attended by over 30 coaches from professional football or rugby clubs in the UK, Finland and the USA.

In addition to this, North American interest is his work has led to the organisation of a series of webinars, which were run on 2 and 3 July 2013 with Major League Soccer team coaches amongst those in the audience.

Akubat's research in the field and dissemination of this work has had two major impacts. Coaches are now educated to a greater degree about training load and secondly where coaches are in a position to change their approach, where they have backing and the finances, they are implementing this new method with their respective squads of players. For example, the Sports Science and Athletic Development (Academy) at Stoke City FC reported that they are in the process of implementing the iTRIMP "to aid their monitoring process with their academy players" (e-mail dated 31/07/2013). Furthermore, Academy Sports Science at Coventry City FC has worked with Akubat for three years and has used the iTRIMP method throughout its development. They stated that Akubat's research had impacted on how coaches and sports scientists at Coventry City FC "understand the training process in our players and we changed our training accordingly".

5. Sources to corroborate the impact (indicative maximum of 10 references)

1. Head of Athletic Development, Stoke City FC
2. Former Head of Academy Sports Science, Coventry City FC
3. Sports Scientist, Crystal Palace FC
4. Sports Scientist, Red Bull Ghana FC.
5. Training Analyst, Hull Kingston Rovers