

SCIENTIFIC COACHING APPROACH: A MEANS OF EMPOWERING NIGERIAN COLLEGIATE COACHES FOR THE ENHANCEMENT OF ATHLETIC PERFORMANCE

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Abstract

Coaching athletes is multi- dimensional and needs a multi- dimensional approach to successfully enhanced athlete's performance. This paper reviewed some scientific approaches to coaching that have direct bearing on the health and fitness of the athletes which subsequently lead to improve skills and performance. Periodic testing of athlete's functional capabilities before, during and performance with assessing athletes movement from biomechanical point of view was discussed as a coaching pattern. Evidences has shown that a number of athletes collapse when playing (recently Muamba of Bolton England) and some meet their instant death on the playing pitch, Sam Okoraji of Nigeria and Vivian Mc Foe of Cameroon) as a result of heart failure and other related complications. The Nigerian Collegiate Coaches need these scientific approaches to his coaching experience to minimize injuries, improve skills and enhance athlete's performance.

Introduction

Most coaches in Nigeria took to coaching profession simply because they happened to be athletes during their prime years as such lack the profession pedigree to successfully deliver and produce the desired outcome. Today, many coaches and athletes are carried away by the desire to win at all cost which leads to the use of illegal means to win competitions. Improving athletic performance is the primary responsibility of coaching while winning is the ultimate aim. This depend on several factors which includes coach's competence and profile; athlete's motivation and personality; methods of training and facility and equipment utilization; coaching environment; athlete's conditioning and assessment; interpretation of tests and utilizing the results; stress and anxiety management to mention but a few. These factors if tackled from the scientific approach of coaching could enhance collegiate athletes' performance and yield a better result.

Nigerian collegiate athletes are not exposed to laboratory training which makes them more prone to variety of avoidable injuries during training and competitions. There always seems to be no cohesion between the level achieved during training and competition. The recovery from injury

is somehow slow and the level at which athletes pick form during recovery is also slow and ineffective. These are indications that the Nigerian collegiate coach needs more scientific approach to his coaching to minimize injuries and enhance athletes' performance. This paper explained testing (fitness, organic and nutritional) and biomechanical analysis as some scientific areas that will be of help to Nigerian collegiate coaches to enhance athletic performance.

Testing Sport performance

Sport performance testing includes series of assessment and analysis primarily on the athlete. Such tests provides useful information on athlete's cardiovascular fitness, muscular endurance, muscular flexibility, muscular strength, body composition, coordination, power balance, speed, agility, heart and lung capacities, blood chemistry and nutrition. These variables have scientific implication to athletes' performance as such need scientific approach to appraise. There always exists a positive relationship between sport physiology testing and performance enhancement (Meyer & Texas, 2000). Sport is characterized with a competitive edge and to be a successful competitor, the coach must select, administer, analyze and interpret tests specific to particular athlete, sport and position (Muller, Benko, Raschner, Schwameder, 2000). Nigerian collegiate coaches should consider and adopt the use of tests to athletes on periodic bases in the above mentioned components so as to minimize injury and enhance performance.

Cardiovascular and performance assessments

These include series of test items such as indirect calorimetry (Laboratory test which produces maximal effect) involves the athletes running on a treadmill during respiratory and metabolic analysis. Results from this test provide information on athlete's peak aerobic power (VO_2 max), endurance capacity, anaerobic threshold and ventilatory responses. Twenty Meters Shuttle Run Test (20 MST), 12 minutes Run/Walk Test, 10 km Jogging Test, Bench Step Test (field tests that produces sub-maximal effect). Results from these tests provide the coach with information on athlete's blood pressure, work capacity and anaerobic threshold.

Power Assessment (Anaerobic)

Wingate Anaerobic Power Test (Laboratory test which produces maximal effect) is one among the power test batteries that which involves work out with calibrated resistance on cycle ergo meter for 30 seconds period. This test provides the coach with information on athlete's peak power (PP), capacity to maintain work out load or mean power (MP) and the rate in power decline during performance or fatigue index (FI). Squat Jumps (sergeant & modified) are field tests and involves taking a broad jump reaching a particular height up. Results from this test give sub-maximal effect on athletes peak power (PP) and mean power (MP).

Body Composition Assessment

Percent body fat is detrimental to performance and if coupled with decreased muscular strength it compromised health (Hergenroeder & Klish, 1990; Meyers & Texas, 2000). Excess body fat results in decreased performance in sport that requires endurance, speed, agility and flexibility. This justifies the need to assess athlete's body composition by the coach. A test of body composition includes Skin fold measurement (Laboratory test which gives sub-maximal prediction). It involves measuring some specific sites of the body (fat depots) which gives a general prediction of body's percent body fat and lean body mass (Orogbonlo & Musa, 2001).

Body Mass Index is another test battery that involves computing athlete's age, height and weight to give prediction of Lean Body Mass and percent body fat.

Flexibility Assessment

This is the test of range of motion (ROM) which is used to describe athletes suppleness. Sit and reach is the most common test for trunk flexibility. This test could be found useful by the collegiate coach especially at pre-season to give information on athlete's degree of flexibility, to detect musculoskeletal restriction that could lead to injury and the test is typically reserved for injury rehabilitation (Meyer & Texas, 2000).

Organic and nutritional analysis

Pulmonary function analysis is the analysis of lung capacities, ventilator efficiency and risk for pulmonary obstructions. Results of this analysis provide the collegiate coach with athlete's oxygen carrying power and its subsequent flow and utilization during performance. A lead electrocardiography work out involves checking the activity of athlete's heart at rest, during performance and recovery. Results from this analysis provide the coach with information on the athlete's heart condition and gives insight about the heart abnormalities. This will help the coach in diagnosing health risk. Blood chemistry analysis provides the coach and the athletes with information about anemia and electrolyte balance /imbalance. Through blood chemistry analysis other health problems which could be of interest to the coach can be detected. A 3 day nutritional recall by the athletes allows for measuring of food units used by the athletes and provide feedback on the athlete's caloric intake, quality of diet, nutritional excesses and deficiencies and recommended daily allowance (RDA) for vitamins and minerals (Meyer & Texas, 2000; Muller, Benko, Raschner & Schwameder, 2000).

Nigerian collegiate coach can make good prediction regarding athlete's functional capabilities (cardiovascular, VO_2 max and performance variables), assess athletes predisposition to injuries (flexibility, strength, cardiac and lung analysis), review the effect of current training (training and competition analysis) by defining and putting into practice these scientific parameters which are pre requisite to his job. Coaching is multidimensional and needs a team approach. These tests can be supervised by professionals in the area of sport medicine, sport psychology and sport science personnel. These personnel are readily available from exercise and sport science programs in many Nigerian colleges and universities to assist the collegiate coach in enhancing youth sports.

Biomechanical Application to Coaching

Biomechanics as the science of movement gives a scientific details of motions from different perspectives such as athlete's striking pattern, reaction time, center of gravity, change of direction, stance, gait and angles and velocity of movements. Coaches in the past took the pain in describing to their athlete's important movement patterns from each of the above mentioned perspectives which resulted in small impact. Later video cameras and video cassette recorders are used to scrutinize and improve athletes performance (Meyer & Texas, 2000). The Nigerian collegiate coach as of today, have a wide choice from computers and high-tech devices which are readily available, simple to operate and rich in retrieving, analyzing, replying, editing and printing a desired movement pattern. These devices can capture images and figures from a 3 dimensions that can be analyzed from different angles. This can help the coach in given specific details on specific movement pattern from specific angle. In the same way the athlete can practice the correct skill from specific angle. This can go in a long way in preventing unnecessary movements and actions which might result in waste of chances and leading to avoidable mistakes. From the biomechanical coaching point of view, good number of athletic

movements can be assessed digitally in the practical field (indoor, outdoor and under water). Computerized movements give the coach opportunity to analyze how injuries occur and how sport trauma can be minimized (Koutedakis,1995).

A coach can enjoy greater benefit from biomechanical coaching point of view through use of movement analysis correctly and it can create a road map for athletic training. In the same way a number of great coaches have successfully analyzed numerous sport skills in soccer, basketball hockey, golf, swimming just to mention but few. (Vanden, De cuper & Van moleBewnicki, 1993; Van Mechelen, Twist, Molendjik, Blom, Snel & Kemper, 1996).

Conclusion

Application of scientific approach to coaching should not be seen as non-applicable to Nigerian sport setting. As stated earlier, coaching is multidimensional and therefore needs a team approach. The coach in collaboration with sport scientist and psychologist can plan a good training and competition schedule that will have a positive impact on the athletes' performance. A number of unfortunate happenings in the field of sport could have been avoided if coaches adopted a team approach to their coaching styles. The collapse and subsequent death of Nigerian foot baller Sam Okwaraji and Vivian Mc. Foe of Cameroun and the recent collapse of Patrick Muanba of Bolton Wanderers of England while playing and the decision of Totten ham Spurs of London for periodic cardiac, lung and blood chemistry analysis are rationales for adopting the scientific approach to coaching by the Nigerian collegiate coaches.

Recommendations

- Nigerian collegiate coaches as a matter of necessity should strive to possess the professional pedigree to equip them with better understanding of some scientific pattern of movement. This will help the coach in designing safety training program for the athletes.
- Universities and Colleges in Nigeria should employ the services of sport scientist and psychologist in designing training, stress and anxiety management, management of injury and rehabilitation of athletes. This will help in improving the health and fitness of the athletes and enhancing their performance.

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