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METHODS ADOPTED BY PLAYERS TO IMPROVE THE PHYSICAL FITNESS

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ABSTRACT

It is imperative that schools and sports groups continually come up with new and innovative ideas in order to encourage students and players to engage in physical fitness. In a nutshell, creativity is a factor that contributes to the improvement of physical fitness. The advancements that pertain to physical fitness have received a very small amount of scientific attention up until this point. The findings of this study will demonstrate that innovative approaches to physical fitness are essential for improving the speed and agility of students and athletes, and consequently, their success on the playing field. Not only that, but if they make use of the most recent innovation, they will be more driven to continue their active participation in sporting practices. There is a correlation between being physically fit and improved athletic performance, and the majority of people discover that regular training is all that is required to achieve their fitness goals. It is essential for athletes to have a high level of physical fitness, as well as agility and quickness on the battlefield or court, in order to achieve success. Badminton and ball players absolutely need to have quick reactions and nimble footwork in order to be successful. Building on the work that was done by Revolution 4.0, the purpose of this project is to develop a collection of innovative tools for physical fitness that will be referred to as "Speed Agility Training Aids" (SATAS). These tools will contain new training variations and innovations in order to assist athletes in reaching their full fitness potential. Because of its potential to improve performance in terms of physical fitness, SATAS is deserving of the utmost attention from the community of sports scientists.

Keywords: *Physical fitness, Innovation, Speed, Agility, Techniques*

INTRODUCTION

Having a high level of physical fitness is one of the most essential conditions for having excellent health. An individual is considered to be physically fit if they are able to complete their regular and unexpected daily responsibilities without becoming exhausted, and if they still have the energy to enjoy their spare time outside of work. When we talk about fitness, we are referring to the degree to which your muscles and joints collaborate to maintain your health and make it possible for you to carry out tasks that are considered to be your regular. An example of efficiency would be carried out by performing routine operations with a minimal amount of effort. Patients who already have cardiovascular disease may stand to gain additional benefits from engaging in physical fitness activities. Increasing one's health and well-being has a multitude of extra advantages, such as reducing the likelihood of getting specific diseases (including cancer, diabetes, and high blood pressure), as well as improving one's quality of life in general. It has been shown that physical fitness is connected with a lower risk of death from any cause, including cardiovascular disease. Even relatively minor increases in physical fitness can have a major impact on one's health.

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Being physically fit not only improves your mood, but it also lowers the likelihood that you will experience negative emotions such as stress, anxiety, and unhappiness. It is impossible for us to have a healthy perception of a person if they are not physically fit. As a consequence of this, it is completely necessary to place a high value on physical fitness in its whole. When it comes to physical fitness, the majority of individuals consider being healthy to be the most important achievement. There is a disproportionately high mortality rate in the modern time due to the prevalence of chronic diseases. A lack of physical activity is the initial stage in the development of the majority of chronic health conditions. A person is considered to be healthy if they do not display any external indicators of sickness, such as mental health conditions like anxiety or depression. It has been suggested by Schuch (2004) that participating in physical activity can offer some degree of protection against depression.

In order to participate in sports, you need to be in excellent physical condition. Building a solid foundation in physical fitness is the first step towards achieving your goals of being the finest athlete in the world and accomplishing incredible things. One of the most important aspects that determines how far a person can go in a certain sport is their level of physical fitness. Dynamic in nature are the many subcategories that comprise the overall concept of physical fitness. It is possible for coaches to place significant emphasis on particular components of physical fitness in order to assist athletes in honing their skills and improving their performance on the pitch. Goals pertaining to physical fitness, mental health, and lifestyle can be expanded upon by concentrating on certain aspects of these areas.

There are two types of physical fitness: fitness for health and fitness for certain duties or abilities. One type of fitness is fitness for health. Health-related components include cardiovascular fitness, strength training, endurance training, flexibility, and body composition. Other aspects include mobility and flexibility. Quickness, power, agility, balance, coordination, and reaction time are the six components that comprise skill-related fitness. Quickness is the highest of these six components. These skill-related components, which are movements, are what determine whether or not an individual is able to demonstrate a multitude of motor abilities and movement patterns. Having a good degree of fitness and participating in a sport is a fundamental need. Athletes and students who are physically fit can reduce the number of accidents and fatalities that are caused by movement, in addition to boosting their speed and agility.

Speed and Agility

Through the development of motor behaviour components such as speed, power, response time, coordination, and balance, the training intends to enhance agility and physical fitness. One of the most important aspects of physical fitness for a wide variety of sports is speed. The capacity to move at a rapid pace is one definition of speed. When you move at a high speed, you are able to cover a specific distance in the shortest amount of time possible. Some athletes train their feet to move at a fast pace, while others train their hands to make rapid work of the ball. Fast sprinters train their feet to run at a high speed. By participating in speed training, athletes have the opportunity to enhance their speed and accuracy. Speed training is comprised of a series of gradual exercises and teaching that are aimed to build the athletes' fundamental motor skills.

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Speed can be broken down into two categories: general speed and special speed as well. Specifically, the ability to carry out a sequence of programmed motions within a specified length of time is referred to as specific speed. On the other hand, general speed refers to the speed with which any motor reaction can be carried out, often over a distance of five to ten metres. The athletes that are able to run faster than their competitors will have an advantage over them. Consider an athlete who possesses remarkable speed: they are able to quickly outrun their competitors or even outrun their pursuers and get to the ball before anybody else. The speed with which a player can move across the court and keep command of the game is directly proportional to the player's capacity for quickness.

Characteristics of an agile person include the ability to change body position quickly, to stop and start motions, to regulate and direct movement throughout the entire body, and to stop and start movements. According to Verstegen et al. (2001), the ability to adjust one's pace, change one's direction, or both in response to a task-relevant signal, such as a pass from a teammate or an opponent, is what it means to be nimble. According to Sheppard et al. (2006), agility is defined as the capacity to rapidly alter the direction or speed of a whole-body movement in response to an external stimulus. You need to be nimble and quick on your feet in order to be agile. This will allow you to avoid or confuse your opponent from the beginning. In its role as a foundational component of motor behaviour, it lays an emphasis on reaching one's full athletic potential.

Agility training should be given a high priority in the strength and conditioning regimens of athletes who participate in team sports. These athletes should also get regular opportunities to practise agility. There are a variety of field sports that might benefit from having competitors who have high levels of agility, as stated by Frederick (2002). Take into consideration the kinds of activities that call for rapid responses. Due to the constant changing of the ball and the activities of their colleagues, quick reactions are required in team sports such as rugby, hockey, football, and basketball. These games emphasise the importance of quick reactions. According to Krolo et al.'s research from 1998, successful football players need to have quick reflexes and the ability to easily change directions. Among the factors that have the greatest impact on a person's dexterity are training components. Due to the fact that different sports and activities require different levels of agility, training for agility formation can be adapted to meet the specific requirements of each sport or activity. It is essential for coaches to have a solid understanding of the most effective training methods in order to inspire their athletes and assist them in enhancing their responsiveness. For every coach who desires to see his athletes become more motivated and agile, it is necessary to have a training system that is both effective and efficient. Not only does the training focus on improving motor behavior-based components of physical fitness, but it also lays an emphasis on agility.

Speed Agility Training Aids Set (SATAS)

The utilisation of scientific knowledge and study outcomes could make the process of training athletes more straightforward. Increasing one's achievement performance as an athlete in the twenty-first century is intrinsically tied to the development of technology, particularly in the realm of sports (Jian-she, 2004). Young athletes will be able to continue to develop their performance and bring Malaysia fame on a global scale as a result of technology breakthroughs, which have made it possible for specialised groups to easily provide answers. People have finally discovered a way to develop their athletic abilities in a manner that is both more effective and efficient, and as a result, their performance has

been constantly improving. This phenomenon is a direct result of the introduction of cutting-edge equipment for physical fitness training. In their 2004 article, Marinho et al. propose that businesses, educational institutions, and research institutes ought to collaborate in order to enhance funding for technological innovation studies, development plans, and policies that are beneficial to students and athletes.

The most significant barrier to the development of this invention is the absence of contemporary training techniques and apparatus in Malaysia, which is the country of origin. Most of the coaches at the school stick to tried-and-true methods while they are working with the younger players at the institution. For the most majority of physical education teachers and coaches, the only alternative available to them is to use traditional training methods. According to one example, badminton teachers often instruct their players to use only rackets designed specifically for badminton and not any other equipment. Because there is no monitoring equipment, the athlete will move in the direction that the coach recommends, but it will not be at the correct area or in the direction that the coach desires. On top of that, coaches do not have access to any technologies that would assist them in monitoring the development or performance of their players.

This phenomenon, which is referred to as the Fourth Industrial Revolution (6IR), is characterised by the confluence of the digital, biological, and physical realms. There have been numerous technological advancements that have contributed to its construction. These advancements include breakthroughs in artificial intelligence, robots, the internet of things, 3D printing, genetic engineering, and quantum computing. A demonstration of how the capabilities of the Fourth Industrial Revolution (4IR) were utilised to improve the Speed Agility Training Aids Set (SATAS) is made available in Figure 1. The researcher exhibited a wide range of skills, including creativity, originality, problem-solving, ideation, analysis, critical analysis, and interpersonal talents. Due to the fact that these factors are driven by 4IR, it is necessary to have a solid understanding of these areas in order to thrive in the dynamic sport industry.

Figure 1 Speed Agility Training Aids Set (SATAS)

As a result of its mobility and user-friendliness, the Speed Agility Training Aids Set is a cutting-edge product that enables athletes to train on their own by eliminating the requirement for a coach or instructor (Figure 1). Individuals who are able to make advantage of the embedded sensors and laptops that are included on the boards in order to enhance their own agility and quickness. Athletes will be able to accelerate when they touch the sound sensor included into the board. This means that whenever a computer detects a sound, it is able to record the numerical count that is transmitted by the sensor through the UNO output. Athletes might be motivated to put in more effort during their training sessions by using SATAS. In a predetermined amount of time, it is able to

determine the number of targets that an athlete is capable of completing (Timer). Through the use of the laptop, instructors and coaches are able to monitor the progress of their players by seeing the data on the device. The efficiency and time savings for coaches and teachers may be enormous, and players could utilise the laptop to keep track of their own improvement for future reference. In addition, the laptop could be advantageous for the athletes.

This breakthrough, which makes use of high-quality sensors to detect sound, has the potential to improve the capability of rapidly changing directions and running towards the appropriate destination within a specified amount of time. Figure 2 offers a visual representation of the SATAS I implementation methodologies. This is depicted in Figure 3, which shows the athlete assuming position in front of touch board 1. Figure 4 depicts the start screen of the game, and Figure 5 depicts the timer, which also functions as a countdown timer during the game. Running in the direction of the touch board is depicted in Figure 6, which displays the athlete. When both players are present in the room, the presence of two ultrasonic sensors may be determined. Compete in a race between the two touch boards in rapid succession. This is a repetition. The on-board sensors (Figure 7) would cause an entry to be triggered in the Arduino UNO R3 Advance Beginner Learning Sensor Starter Kit V5 (Figure 8). This would occur whenever the player engaged in movement. New functionality is added to the UNO board (Figure 9) by the addition of a sensor that is able to detect the player's touch on the board. The UNO board's exit signal (Figure 8) will be sent to Display 1 in order to add a COUNT value (Figure 9). This will occur based on the frequency of the player's touch that is sensed by the sensor. Following the expiration of the timer (Figure 5) and the sound of the buzzer (Figure 4), the final Count value will be displayed for your viewing pleasure.

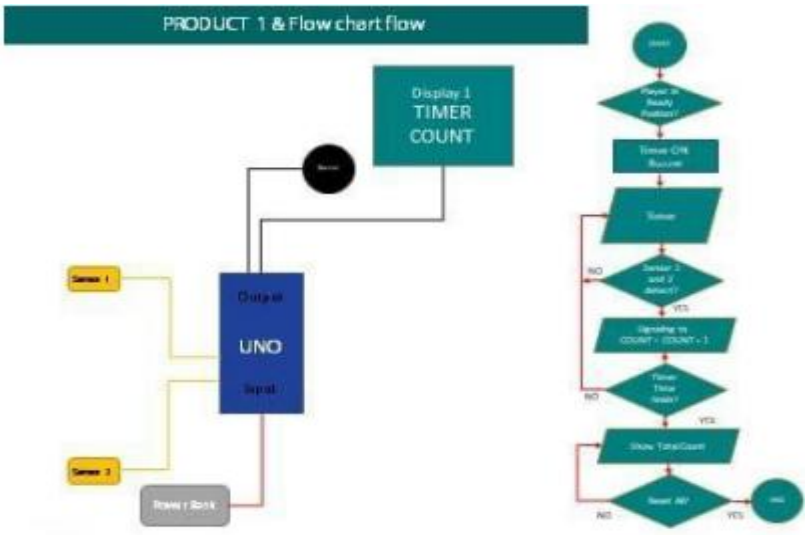

Figure 2 SATAS Flow Chart

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Figure 3 Touch board 1

Figure 4 Buzzer

Figure 5 Laptop

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Figure 6: Touch board 2

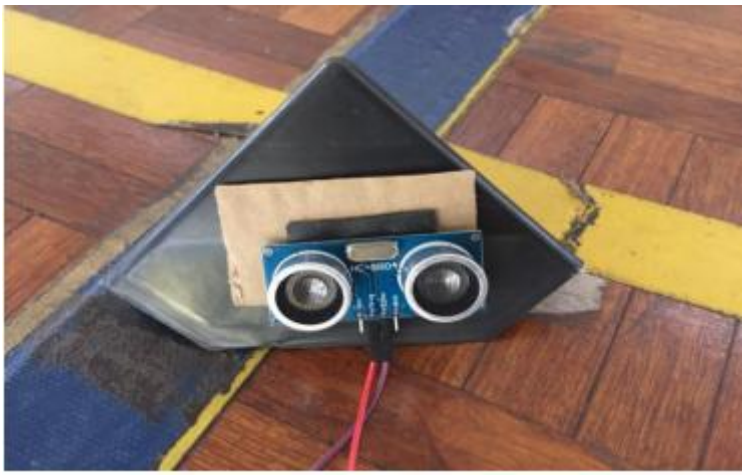

Figure 7 Ultrasonic Sensor

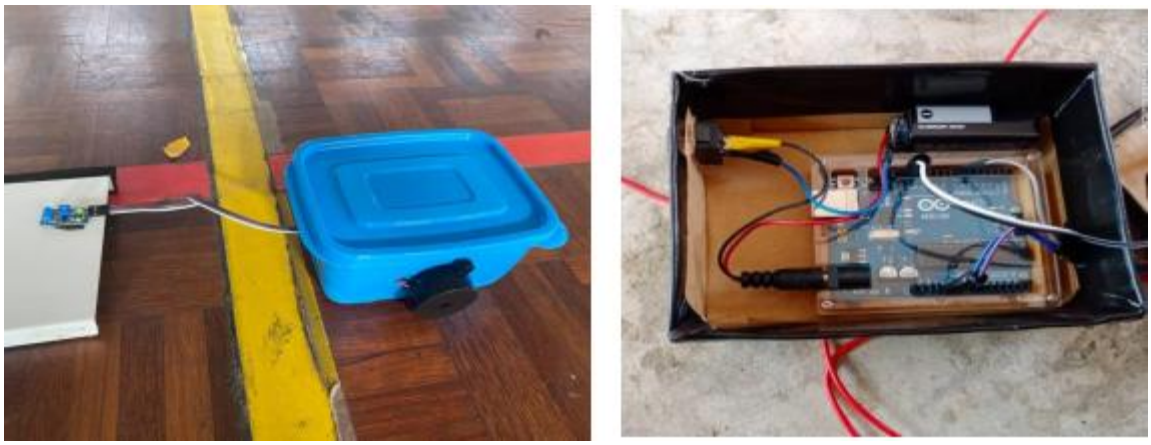

Figure 8 Arduino UNO R3

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Figure 9 Numeric Display

DISCUSSION

When it comes to sports, innovation is a relatively new topic that pulls from a diverse variety of fields and experiences. The following are some examples of innovations in the sporting world: technological developments, tools, and equipment; innovative approaches and coaching; consumer goods and services; digital content and venues; and so on. In the field of sport innovation research, people continue to face obstacles that are social, institutional, and organisational in nature. When investigating the phenomenon of innovation, this point of view ought to be taken into consideration in any future research that is conducted on innovations in sports. It is essential to do research on a variety of themes, including social innovations in sport, effective management and leadership of sport innovation, and emerging technologies, equipment, and product lines, because all of these things contribute to the development of modern sport.

The Speed Agility Training Aids Set (SATAS), which was inspired by badminton, is a set of training aids that evaluates a player's ability to move fast and agilely in three different directions: forward, backward, and side to side. When it comes to getting into better shape, the SATAS is an excellent instrument that can be utilised by both students and sportsmen alike. They experienced a significant improvement in their physical fitness as a result of using this cutting-edge training aids kit. Teaching and learning are enriched with diversity, excitement, and pleasure thanks to the SATAS, which not only improves understanding of sports concepts but also enhances the overall experience. In addition, this is true for each and every variety of athletics.

CONCLUSION

The highest possible speed of movement, the capacity to maintain that speed while minimising deceleration, and an individual's personal velocity, which is the rate at which they can accelerate from a standing start, are the three factors that determine an individual's speed. Air resistance and excess body weight are two factors that can slow down a person's speed, in addition to their strength and power. The use of SATAS makes training more enjoyable and feasible, especially in situations when a coach is not immediately present. Additionally, it is expected that players will become more enthusiastic about and engaged in speed and agility training as a result of SATAS. The usual techniques of training agility and speed have been revolutionised by SATAS, which is in line with the current 4.0 industrial revolution.

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