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Research Project

What types of volleyball apparatus (training aids)/technology could be used to enhance the preparation of the Barbados national volleyball teams?

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SUMMARY/ABSTRACT

The Barbados Volleyball Association, having received funding to aid with its developmental programmes and the preparation of its national teams, has embarked on a journey to ascertain the most beneficial types of volleyball equipment, training aids and or technology to improve the preparation of its national teams in the hope of achieving better performances. The Association, however, knows there are other resources which are necessary for the use of such technology to be beneficial and without which the returns on their use and investment may be reduced or less than desired.

In order to select the most appropriate types of volleyball equipment for the Barbadian context, the researcher contacted 14 volleyball professionals based on success of national teams on the international stage (FIVB Rankings) and FIVB continental zones. A total of seven responded. Three of the five continental zones were represented by the respondents, these were Europe two (2) respondents, South America two (2) respondents, North and Central America & Caribbean three (3) respondents. The results of the research identified six types of volleyball apparatus and technologies believed to be important to team preparation: video recording and analysis technology, volleyball attack machines, adjustable target nets, target challengers, vertical jump trainers and plyometric jump boxes.

Respondents also noted that key resources such as access to finances and facilities, increased training and the expertise of coaches and support staff are integral to the ability to fully leverage the use of volleyball technology. Therefore, it is paramount for the Barbados Volleyball Association to continue to access available funding through its NOC and governmental agencies in order to sustain its use of volleyball technology. The Association must also seek to continue its

collaborative outreach programmes with secondary schools in the island, as these schools have the infrastructure which can be upgraded to meet the training needs of volleyball athletes. The proposed upgrades to these facilities include installing new foundation to accommodate overhead covering (roof) and installation of volleyball flooring, lighting and ventilation systems. These upgrades will be facilitated via a three-way partnership where the schools and National Sports council will be required to fund facility renovations and the Barbados Volleyball Association will source and install the volleyball equipment (indoor flooring/court, polls and net structure along with officiating stand, antennae and balls). This is integral to the level of success which can be achieved as there is fierce competition with federations of similar sports to have access to the few indoor facilities available on the island.

RÉSUMÉ

L'Association de volley-ball de la Barbade, ayant reçu des fonds pour l'aider dans ses programmes de développement et la préparation de ses équipes nationales, s'est lancée dans un voyage pour déterminer les types d'équipements de volley-ball, d'aides à l'entraînement et/ou de technologies les plus bénéfiques pour améliorer la préparation de ses équipes nationales dans l'espoir d'obtenir de meilleures performances. L'Association sait toutefois que d'autres ressources sont nécessaires pour que l'utilisation de ces technologies soit bénéfique et que, sans elles, le rendement de leur utilisation et de leur investissement peut être réduit ou inférieur à ce qui est souhaité.

Afin de sélectionner les types d'équipement de volley-ball les plus appropriés au contexte barbadien, le chercheur a sélectionné quatorze professionnels du volley-ball sur la base du succès des équipes nationales sur la scène internationale (classement FIVB) et des zones continentales de la FIVB. Trois des cinq zones continentales étaient représentées par les personnes interrogées, à savoir l'Europe (deux répondants), l'Amérique du Sud (deux répondants) et l'Amérique du Nord, l'Amérique centrale et les Caraïbes (trois répondants). Les résultats de la recherche ont permis d'identifier six (6) types d'appareils et de technologies de volley-ball considérés comme importants pour la préparation des équipes : la technologie d'enregistrement et d'analyse vidéo, les machines d'attaque de volley-ball, les filets à cibles réglables, les challengers à cibles, les entraîneurs de saut vertical et les boîtes à sauts pliométriques.

Les personnes interrogées ont également noté que des ressources clés telles que l'accès aux finances et aux installations, une formation accrue et l'expertise des entraîneurs et du personnel de soutien font partie intégrante de la capacité à tirer pleinement parti de l'utilisation de la technologie du volleyball. Il est donc primordial pour l'Association de Volleyball de la Barbade de continuer à accéder aux financements disponibles par le biais de son CNO et des agences gouvernementales

afin de maintenir son utilisation de la technologie du volleyball. L'association doit également chercher à poursuivre ses programmes de collaboration avec les écoles secondaires de l'île, car ces écoles disposent d'une infrastructure qui peut être améliorée pour répondre aux besoins d'entraînement des athlètes de volley-ball. Les améliorations proposées pour ces installations sont les suivantes : installation de nouvelles fondations pour accueillir la couverture aérienne (toit) et installation d'un revêtement de sol pour le volley-ball, de systèmes d'éclairage et de ventilation. Ces améliorations seront facilitées par un partenariat tripartite dans lequel les écoles et le conseil national des sports devront financer les rénovations des installations et l'association de volley-ball de la Barbade fournira et installera l'équipement de volley-ball (sol/terrain intérieur, poteaux et structure de filet ainsi que stand d'arbitre, antennes et ballons). Cela est essentiel pour le niveau de succès qui peut être atteint, car il y a une concurrence féroce avec les fédérations de sports similaires pour avoir accès aux quelques installations intérieures disponibles sur l'île.

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List of Definitions

Artificial training	Term used interchangeably with "traditional training" methods in volleyball by Liwei Rao (2020).
Relevance	The extent to which the programme/project's objectives are pertinent to the evolving needs and priorities at both the national and regional level (Pounder, 2011, February).
Sustainability	Sustainability is the extent to which the positive changes can be expected to last after the project has been terminated. (Pounder, 2011, March)
Technology	Technology is the application of scientific knowledge to the practical aims of human life or, as it is sometimes phrased, to the change and manipulation of the human environment. Sporting technologies are man-made methods, developed to reach human interests or goals in or relating to a particular sport. Technology in sports is a technical means by which athletes attempt to improve their training and competitive surroundings in order to enhance their overall athletic performance. https://www.britannica.com › technology › technology

For the purpose of this report, the following terms have been used synonymously or interchangeably.

- evaluation and research
- apparatus, equipment and training aids
- survey tool and survey instrument
- federation and association

CHAPTER 1.0 INTRODUCTION/ CONTEXTUAL BACKGROUND

The Barbados Volleyball Association (BVA), established in 1976, is a national federation that is organised and managed by volunteers, and there is no fixed place of business or permanent staff to oversee its daily operations. Based on a small island with a total population of less than three hundred thousand (< 300 000), there is great competition among the various sports for athletes. However, with a strategy to increase the visibility of the sport in schools, the BVA has seen an increased level of interests in the 8 to 21 years age groups, which we refer to as our Youth & Juniors.

The Barbados Volleyball Association has a tradition of excellence as a national federation and a long legacy within the sport, having won several Caribbean regional championship titles (at all levels: Youth, Juniors, Under 23 and Seniors) over the last three decades; with very little technological assistance. However, this level of success has not transcended beyond the regional level. Although for the purpose of this research the scope is narrowed to the sport of volleyball, this problem exists for most, if not all, sports in the island.

If there is one thing the Covid-19 pandemic has taught us is the need to adapt to a crisis and change our problems or challenges into opportunities. But how do we do this? It also propelled us into the virtual world and promoted the digitization of tasks which were once perceived as physical, in-person tasks. The world has learned to embrace technology and Barbadian sporting organisations need to do the same. It is time for a fresh start, a time to embrace changes which can enhance our overall preparation and hopefully, transcend into improved performances. Our vision as an association is to be competitive beyond the Caribbean region and we believe greater use of

technology in the preparation phases of our national teams to be one of the important factors that will assist us in achieving greater and better performances.

PROBLEM DEFINITION

What types of volleyball apparatus (training aids)/technology could be used to enhance the preparation of the Barbados national volleyball teams?

Rationale

The performances of the Barbados Volleyball National Teams at Caribbean regional championships over the last thirty years can be described as impressive. However, as these teams ventured onto the greater international stages, they have been unable to achieve the same level of success which they enjoyed at the Caribbean regional level. This has caused the association to evaluate its training processes in an attempt to improve individual as well as overall team performances.

Although other factors exist such as access to training facilities, funding, and contact hours for athletes, these are threats which are controlled by the environment in which we operate. The BVA has therefore sought to implement structures which it can control to enhance the training and performance of its teams. One such structure is the introduction and greater use of volleyball apparatus (training aids)/technology which have been proven to improve the preparation and performance of volleyball athletes and guide its administrators, coaches and trainers. The BVA has accessed funding from its local National Olympic Committee (Barbados Olympic Association). This funding is accessed through the request for the required funds to purchase identified volleyball technology and allocation of funds. Additional opportunities exist to receive

further funding through Olympic Solidarity in the form of the Development of National Sports Systems (DNSS) programme.

The purpose of this research project is to gather the necessary information which can guide the selection of the most suitable types of volleyball technology and apparatus to enhance the preparation of athletes within the national programmes of the Barbados Volleyball Association for participation in the wider regional and international competitions.

CHAPTER 2.0 REVIEW OF EXISTING KNOWLEDGE

2.1 Sport Technology Defined

Technology, as defined by Encyclopedia Britannica, is “the application of scientific knowledge to the practical aims of human life or, as it is sometimes phrased, to the change and manipulation of the human environment” or “machinery and equipment developed from the application of scientific knowledge” (Oxford Online Dictionary, 2022). Loland (2001) stated technology is “understood as human-made means to reach human interests and goals”. More specifically, sports technology refers to the “man-made methods developed to reach human interests or goals in or relating to a particular sport”; moreover, it is “a technical means by which athletes attempt to improve their training and competitive surroundings in order to enhance their overall athletic performance” (Britannica, 2022). IGI Global (YEAR) concurs, defining technology in sports as “a technical means by which athletes attempt to improve their training and competitive surroundings in order to enhance their overall athletic performance”.

Technology can range from the very simple apparatus to more complex or advanced equipment and digitized or computerised equipment; technology used in volleyball is no different. Loland (2021) agreed, purporting sport technology ranged from body techniques, via traditional sport equipment used by athletes within competition, to performance-enhancing machines, substances, and methods used outside of the competitive setting. There is a variety of technology used in volleyball, which ranges from personal use apparatus to more complex machines and digitised recording, monitoring and evaluating programmes and equipment. Sahoui (2022) argued “technology has had a substantial impact on the world in general, and it's no different when it comes to sports training”. As changes and adaptation occur throughout the world, so too has the

way in which volleyball athletes train and prepare. The advent of sports and more specifically volleyball technology and its use has resulted in stronger, more consistent and competitive athletes. “In fact, modern technology has made it possible for athletes to reach their potential in ways that were once unthinkable” (Sahoui, 2022).

2.2 Types of Technology Used In Volleyball

Andrews (2022) in her review of volleyball training aids, highlighted a number of what she identified as the best training volleyball aids. A number of training apparatus or equipment utilised in volleyball training were also identified on Volleyballusa.com, Amazon.com and Tandemsports.com. These include but are not limited to the following:

According to Amazon.com and volleyballusa.com, one of the simplest pieces of volleyball equipment is the ***Volleyball Setter Training Gloves*** ($16.99 USD *Amazon.*com) or ***Setting Technique Training Aid*** ($17.99 USD, *Tandem Sports*). These are simple wearables which allow for the correct placement of the hands for the overhead pass or set. This assists with the development of the correct technique and in turn should result in greater accuracy and fewer fouls.

Volleyballusa.com showcased the ***Volleyball Pal*** ($16.99 USD *Amazon.*com/ $23.99 *Tandem Sports*, $29.95 USD *volleyballusa.com*) which is equipment that is designed to help players train and tone specific muscles to improve performance and endurance during games. It consists of a Velcro strap that secures around the waist, a neoprene pouch that holds the Volleyball, and an elastic cord connecting the waist strap to the ball pouch. The smooth action of the elastic cord guides the ball back to the player every time. It is intended to assist with the practise of serving tosses and arm swing technique, without the player having to constantly chase or be fed a ball.

Similar to the Volleyball Pal is the ***Spike It*** ($249 USD *volleyballusa.*com) which is a favourite of volleyball coaches the world over to develop and refine the skills of spiking and serving. According to volleyballusa.com, this apparatus is invaluable to beginners as well as more advanced players. It allows beginners to develop proper or correct arm swing while providing opportunities for more experienced players to concentrate on perfecting the already existing skills. Additionally, the ***Volleyball Spike Trainer*** ($99.95 USD *volleyballusa.com*, $15.99- $21.99 USD *Amazon.*com), ***Spike Training System*** and ***Elastic Volleyball Resistance Belt Set*** are also types of equipment used to improve serving, arm swing mechanics and spiking power.

Another training tool used is the ***Pass Rite*** ($32.99 USD *Tandem Sports*) *which was created by Tandemsport. Tandemsport describes the Pass Rite as an apparatus which* utilizes a durable elastic band that attaches to the passer's wrists and ankles to prevent excessive upward arm movement. The small, lightweight Velcro wrist cuffs were designed to minimize ball contact interference and the elastic band is adjustable to accommodate any passer's height. Other machines which assist with forearm passing accuracy, setting, serving and spiking accuracy include ***Adjustable Target Nets*** (amazon.com), the ***Target Challenger*** ($369 USD *volleyballusa.com,* $450 USD *Tandem Sports*) and the ***Catch It*** ($695 USD *volleyballusa.com*, tandemsport.com). These machines are light weight and easily adjustable to switch from one purpose to another.

The ***Volleyball Vertical Jump Trainer*** and ***Plyometric Jump Boxes*** ($499 USD *volleyballusa.*com) are designed to improve leg strength and enhance jumping ability. Whereas the ***Bungee Blocker Volleyball Blocking Tool*** ($99 USD *volleyballusa.com*, $136 USD *Tandem Sports*), ***Block Blaster*** ($250 USD *Tandem Sports*) and ***Quad Blocker*** ($310 USD *Tandem Sports*) are used to assist in developing and perfecting the skill of placement when attacking, where the attacker . On the other hand, the ***Block It*** ($299 USD *volleyballusa.*com) and ***Block It Buddy*** are

apparatus which allow for the simulation of game type situations for the practice of spiker coverage in order to defend the blocked spike as the ball rebounds similarly to a “real” block.

One of the more complex and heavier machines used in volleyball training is the ***Attack Volleyball Machine*** (($3 499.00 USD amazon.com, volleyballusa.com). This machine serves multiple purposes as it is able to replicate serves (high velocity, controlled top spin and floaters); provide a low ball release to simulate a pass for setting as well as a higher release above the net to replicate serves and spikes for digging drills.

More advanced technology used in volleyball includes ***Wearables*** which is technology designed to show how an athlete’s body is functioning. Roda (2019) stated, these are devices, accessories or gadgets that are worn both on and off the court to gather data on heart rate and load on specific muscle groups. He argued this data allows coaches and trainers to acquire precise performance measurements and identify areas of need in individual athletes. These devices are designed to be small or integrated into practice or game wear and include watches and other monitoring devices.

Another type of technology used in volleyball is Hudl ($2,999 USD available from https://www.hirisecamera.com/product/endzone-camera-sky200gc/). According to the Hudl website, “Hudl is a recording application specifically designed for sports enthusiasts and coaches to help them capture and review the moments that matter in games.” This application allows coaches to upload videos, photos or audio clips inn order to create files for analysis. It’s specific benefits include automatic video capture, instant playback, real-time feedback, analytics and access to a mobile application (which allows coaches to use their cellular phones when they are away from their computers). As purported by its website, the tool is not just about improving the

skill of the athlete but it allows player and coaches to analyse how they are performing as well as their opponents in order to strategize for better results.

2.3 The Role of Sport Technology in Team Preparation

Roda (2019) stated “the right tech can have a massive impact on an athlete’s ability to perform and improve over time”. He further suggested the use of technology allows for the replication of the different situations which athletes might face during competition; thus allowing them to be more informed about their recovery and implement a data-driven approach to training. Similarly, Matiiuk (n.d.) purported technology can have “many impacts on sports” but these impacts depend on the way the technology is implemented and interpreted. She further identified four major impacts as: improved muscle tone, improved ability of players re serving, tosses and arm swing technique.

Liwei (2020) concurred, stating that with the current times and growing popularity of computer technology, researchers have found computer technology can help athletes to train volleyball. Liwei (2020) further purported the use of computer technology having greatly improved the efficiency and quality of volleyball training when compared to the traditional or artificial training methods in China. Therefore, “with the continuous progress in the field of volleyball training, computer technology is more and more widely used in the training of athletes” (Liwei, 2020).

2.4 Benefits of Sports Technology

Sahoui (2022) identified two over-arching benefits to the use of sports technology: athletes are able to get feedback and improve their performances, and trainers are able to monitor athletes' progress and identify potential problems. Sahoui further elaborated stating technology: has increased athletic potential which can be substantiated by the use of wearables and other monitoring technologies; can be used to improve athletes' performances; can allow coaches and trainers to make informed decisions; prevent injuries by tracking and monitoring movement, thus indicating potential problem areas as well as monitor the recovery progress of athletes.

Sahoui also purported technology can act as a motivator to athletes, providing feedback and sometimes eye-opening realities on performance. He further identified its use to customise training as athletic trainers have greater access to a wider variety of tools which can assist or customise the training programmes for their athletes; thus making training more efficient and effective. Therefore "athletic trainers are able to use technology to their advantage, making athletes faster, stronger, and more agile" (Sahoui, 2022). Sahoui (2022) further purported technology will have a profound impact on sport in the future as it will help athletes: become more efficient and effective in their training; analyse their performance and find areas for improvement; track their progress and set new goals; stay healthy and prevent injuries; and connect with other athletes and coaches to share information and ideas.

The BBC (2022) in their online article entitled, "Technology in Sport" also highlighted a number of benefits to the use of technology for athletes. These include: "Better performance- marginal gains make the difference; better medical care results in fewer injuries or faster recovery from

injury; feedback from coaches is more focused, objective and helpful; and improved kit is more comfortable, more efficient and safer".

2.5 Disadvantages of Sports Technology

Although there may be many benefits to the use of technology, one must also be cognisant of its disadvantages. Matiiuk (n.d.) identified the following disadvantages: lack of time to use technology, lack of facilities and technology can generally only be used in training. She further elaborated suggesting if athletes do not have adequate time to train and access to facilities is limited, the skills of the athletes cannot improve.

BBC (2022) concurred, highlighting the use of technology can invade the privacy of athletes as it can blur the lines between personal and professional time. The article also highlighted the availability and cost of technology can make sport and success exclusive to wealthy people and countries. It may mean a coach would need to have access to high-end technology in order to help their athletes train and perform at the highest level. It also means coaches would have to remain up-to-date on types of technology and how to interpret the results as well as have access to finances in order to afford the required technology. "This means that coaches working with organisations that have a lot of money are going to be able to help to support their athletes to get to higher performance levels compared to coaches working with organisations with lower incomes which have less money to spend on technology" (BBC, 2022).

2.6 The Shift to Employing Sports Technology in Barbados

Sports organisations in Barbados have primarily used traditional means of governing, training and preparation of their athletes. According to Forde-Craigg (2021), in 2021 the Barbados Cricket Association launched its new website and was lauded by the then Minister of Sports for its efforts. In his address at the official launch of the website, the minister further encouraged all sporting organisations on the island to "utilise technology in their administration and development" (Forde-Craigg, 2021).

Minister Sutherland, as cited by Forde-Craigg (2021), highlighted the opportunity for sporting organisations to "leverage the power of technology to maximise the potential of our sportsmen and sportswomen" as being critical to Barbadian local talent to make meaningful contributions to the island, the region and the world. He further indicated his support for sporting organisations which embraced the role technology could play in unlocking the true potential of sports. He further highlighted the fact that the use of technology, virtual or online media, should bolster communication between associations, their players, and fans.

Although his specific remarks were geared towards the Barbados Cricket Association, Minister Sutherland as cited by Forde-Craigg (2021), highlighted the use of technology, the modernisation of sporting infrastructure, a focus on athlete development and upgraded sporting delivery platforms and services as integral "for the association to nurture, promote and expose Barbados' cricketing talent from the grassroots stages to the international arena".

2.7 Use of Sports Technology

According to the Catapult website/blog, the Wisconsin Badgers sought to improve team preparation and performance and employed the use of the wearable, 'Catapult'. Described as "the smallest tracking technology for elite sports" the Catapult is wearable technology which collects athlete specific data, especially 'PlayerLoad'. This allows coaches and trainers to make informed decisions regarding training, preparation for practice sessions and individual athlete performance.

Coach Schultz, as cited in the blog, highlighted the ability of the Catapult to assist him with the identification of the work performed by non-jumping athletes such as liberos and defensive specialists. He also highlighted the ease of use of the Catapult technology as it is accompanied by the Catapult Customer Success team which offers support services to its users from the onboarding or set up process through to competitions. He further noted this meant there is no need to employ additional staff for data interpretation and analysis; however, he indicated the team had a dedicated Catapult sport scientist who helped to customise the team's programming to reflect the unique characteristics of individual athletes, based on their practice and match data.

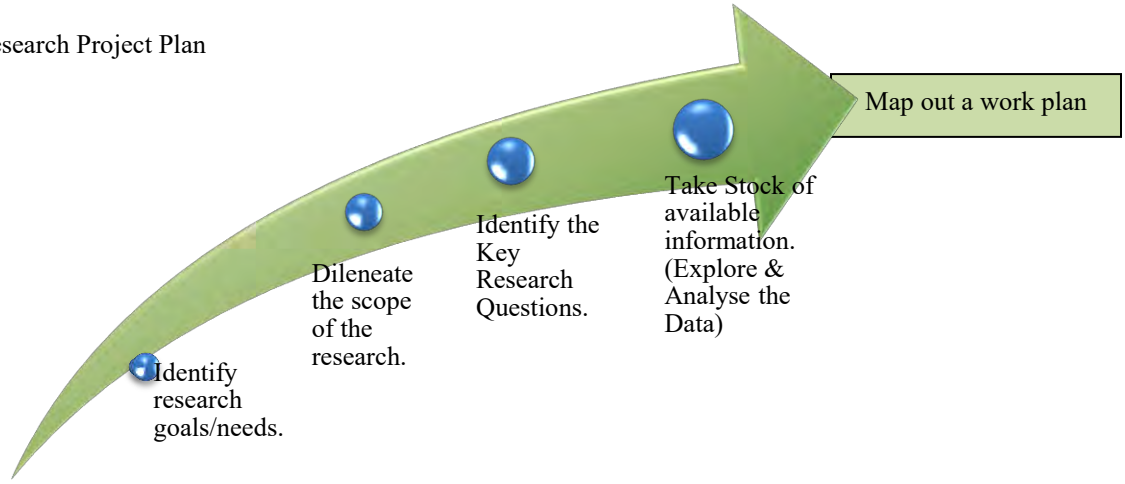
Liwei (2020) proposed the belief that China strongly supports the development of volleyball. He further purported "With the progress of science and technology, the development of volleyball training in China is very fast" (Liwei, 2020). He argued the traditional or artificial training methods lacked innovation and China therefore sought to "improve the speed and efficiency of training" by having their researchers learn from foreign volleyball techniques which resulted in the country's gradual introduction and studying of the application of volleyball training under volleyball technology. He concluded the development of economy and technology has resulted in more attention being paid to sports, resulting in the extensive application of computer technology in the

field of volleyball training. Liwei (2020) however noted a combination of artificial or traditional training methods and the use of computer technology can help players improve skills in the training of volleyball.

CHAPTER 3.0 DATA COLLECTION METHODOLOGY

In order to develop a suitable method of data collection for the proposed topic, the following Research Project Plan, ***Figure 1***, was designed as a graphical representation of the process for the research undertaken.

Figure 1: Research Project Plan



3.1 Research Scope

The research commenced on Saturday September 10th, 2022 and was projected to last until Monday July 10th, 2023. It was designed as a formative evaluation of the use of volleyball technology in the preparation of volleyball teams for competition. It included the collection of data from both primary and secondary sources, analysis of data, synthesizing of quantitative and qualitative data to make SMART (specific, measurable, achievable, realistic & time bound) recommendations and justifiable conclusions for the proposed use of volleyball technology. The research was limited to the preparation of high performance national teams; and did not extend to teaching and learning of the sport at the grass root level, although its findings could have implications for the grass roots level.

Limitations

The number of responses was limited due to the selection criteria which focussed on "success stories" within the volleyball fraternity. "Success stories" are the teams with proven success, such as title holders for various tournaments or qualification for Olympic Games and World League tournaments. However, it was noted by the researcher that any conclusions drawn from the analysis of the data collected from this type of research could not be generalised to the greater volleyball fraternity.

The selectees were also chosen to reflect the different continental volleyball regions as these regions tend to vary the training and preparation methods and have used different types of technology. With the majority of respondents being from larger and more developed countries, this impacted the generalizability of the results to the Barbados context as Barbados is a small developing country.

3.2 Key Research Questions

1) What types of sports technology are available for the preparation of volleyball athletes?

2) What are the most impactful volleyball training aids/technology to improve team preparation?

3) What is necessary to fully leverage the capabilities of the training aids/technology?

4) What types of volleyball training aids/technology are most suited for the Barbados context, considering price, accessibility, training required, ease of use and overall practicality.

3.3 Mapping out the Work Plan

A variety of evaluative tools and techniques was used to conduct the research due to the intrinsic advantages and disadvantages associated with each tool and technique.

The first step involved the construction of a Research Work Plan (See ***Appendix 1***). This was followed by the collection of relevant secondary data in the form of peer reviewed journal articles, blogs, organisational documentation and media articles in order to ensure a concise but adequate scope for the research. This step assisted in the formulation of **SMART** objectives; as well as provided the basis for the determination of sampling techniques, sample size and the corresponding indicators for the research. In order to conduct the research, it was necessary to survey an adequate but manageable number of administrators, coaches and managers from the volleyball fraternity which would provide an adequate base for academic research.

Primary Data Sources

Questionnaires (email/SurveyMonkey) were used in the collection of primary data. To ensure value and balance were maintained, a stakeholder analysis was conducted (***Appendix 2***).

Questionnaire Design

In compliance with recommendations given by Saunders et al. (2007), questionnaires were designed to encompass quantitative as well as qualitative questions to:

- quantitative- one, reduce the time taken to complete the questionnaire by the respondent; two, limit response options to achieve concise answers; and three, reduce response ambiguities; and
- qualitative- one, encourage respondents to give comprehensive responses; two, get factual information; three, expand a list; and four, explain a prior answer.

The questionnaire sought to address the themes which were suggested by the key research questions. These included Level of Support for Volleyball Technology, Suitability of Technology & Factors Required for The Use of Volleyball Technology to Be Beneficial.

A three-page questionnaire, with 9 items was constructed in Surveymonkey to collect data from administrators, coaches, technical directors and managers. The cover letter outlined the purpose for which the research was being conducted, a statement of confidentiality, as well as a statement informing the respondents where further information can be obtained and an extension of appreciation to the respondent for their participation, as advocated by (Shuttles, 2008).

On February 21st, initial emails were sent to 10 national team liaisons and administrators, two (2) coaches, one (1) former technical director (now head coach) and one (1) FIVB instructor with a link to the questionnaire. As responses were slow by the middle of March, follow-up emails were sent to 12 selectees as only two had responded. Calls and emails were also made and sent to initial contact persons to assist with encouraging selectees to respond. In the end a total of seven (7) out of 14 responses were received.

Sample Selection

A targeted sample was selected to cover the top two (2) indoor volleyball teams, according to FIVB World Rankings, in each of the five (5) FIVB Continental Zones as well as the most recent successful competitors within the Caribbean Zonal region. The countries identified included Turkey and Poland (Europe) U.S.A. and Dominican Republic (NORCECA), Brazil & Argentina (South America) Tunisia and Cameroon (Africa), and Japan and China (Asia and Oceania); as well as United States Virgin Islands, Suriname as well as a former technical director and an FIVB Instructor with the Coaching Coaches Programme. Initial contact was made for European and South American teams via MEMOS XXV participants who worked directly with personnel identified from each team. NOC contacts for Poland and Brazil are current participants in the MEMOS XXV program. US Volleyball was contacted through their web page and direct emails to a team representative who communicated with the respondent. The FIVB Instructor was contacted through the 1st Vice-President of the BVA who sent emails and WhatsApp correspondence directly. This FIVB Instructor was specifically chosen as he had previously conducted coaching sessions with BVA coaches, athletes and physical education teachers in Barbados on two occasions, and would therefore understand the Barbados context. He works with the FIVB Coaching Coaches program which seeks to enhance the coaching skills of national team coaches. The two CAZOVA federations were contacted via direct links re WhatsApp and emails as provided by the 1st Vice-President of the BVA. The African and Asian/Oceania federations were contacted via direct links through their web pages and emails.

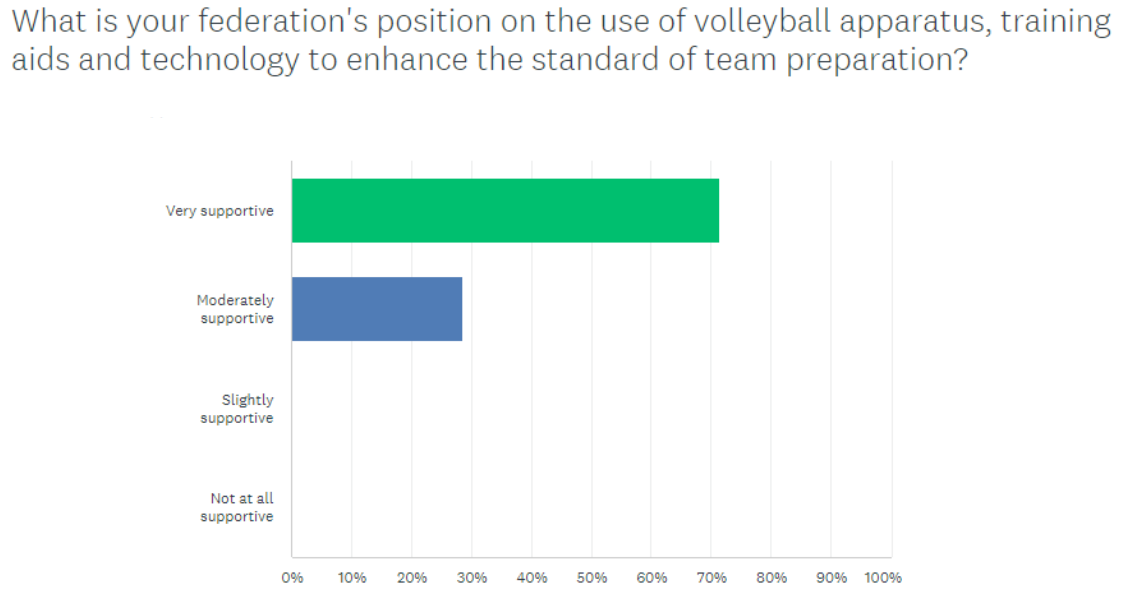
Data Analysis

Once responses were returned, the survey tool was used to perform the data analysis. The full results of the survey conducted can be found in ***Appendix 4***. The results from each question asked were generalised and responses which saw the majority of respondents selecting (>60%) were highlighted. They were summarised and presented in written and pictorial format for further analysis and discussion in the following chapters. The analysis was conducted and reported under the themes which were intertwined in the research questions from the previous Section 3.3 of this document.

CHAPTER 4.0 RESEARCH RESULTS

A total of seven out of the emailed fourteen surveys were collected. The survey respondents' positions in the field of volleyball included 1 assistant coach, 3 head coaches, 1 chief of sports, 1 national team specialists and 1 general manager. The experience of the group ranged from a minimum of four (4) years (14.3 %) to twenty (20) plus years (14.3 %), with 4 out of the seven respondents having ten plus years of experience. In terms of the level of support federations gave to the use of volleyball technology to enhance the standard of team preparation, 70% stated the federations were very supportive and the remaining respondents stated their federations were moderately supportive of its use as shown in ***Figure 2*** below.

Figure 2: Level of Support for The Use of Volleyball Technology by Federations



When asked the three (3) most important/key factors they deemed necessary for national team success the respondents identified a variety of factors as given in ***Table 1***. When the ***most important factor*** was analysed, responses centred around team ethos with three of the seven or 42.9% of respondents identifying this factor. Four out of seven or 57.1% of respondents in ***2nd most important factor*** highlighted factors surrounding the coach e.g. high level, vision, ability to motivate players and experience. There were different answers by each of the respondents for the ***3rd most important factor***, therefore there was no clear trend as none of the responses were repeated.

Table 1: The Most Important Factors To National Team Success

Most Important Factor	2nd Most Important Factor	3rd Most Important Factor
Desire to fight for the flag	High level coach	High level performance centre
Creating a team as a collective	Trust in the coach's vision	Good atmosphere
Money	International games experience	Player motivation
Integrated work between coaching staff, support team and athletes	Coach's ability to get the most out of each player	Good training facilities and equipment
Exceptional, experience athletes	Exceptional, experience coaches	Exceptional, experienced performance staff (sports science, sports medicine)
Team cohesion	Pride of the country/team	Continuity of the program
Team culture	Consistent training schedule	Video breakdown of opponents/scouting process

Respondents were also asked the type of volleyball apparatus, training aids and technology which they have supported and/or used for the preparation of national teams. ***Figure 3*** below shows their responses.

Three of the seven or 42.9% of respondents specifically mentioned VERT, which is a "clinically validated measure of vertical displacement (jump Height) and jump count from an IMU (inertial measurement unit)" according to myvert.com. It is similar to Catapult technology as it allows coaches and athletes to monitor workload in terms of energy, movement economy, efficiency, mechanical stress, reactive strength and ground contact time; thus, allowing coaches to flag higher injury risk athletes easier.

Similarly, 42.9% of respondents also identified DataProject (data volley) technology which allows coaches to scout and analyse their players or opponents either live or from previous video recordings. Whether it be Hudl, DataProject or another type of video analysis technology, six out of the seven respondents or 85.7% identified video recording and analysis technology as volleyball technology which they have supported or used for the preparation of national teams.

Figure 3: Volleyball Apparatus, Training Aids/Technology Supported & Used

Serve machine, VERT - for physical preparation, DataProject scouting, setters rings, blocking machine
camera, computer, data volley program
Depending on local conditions, video and statistics very important
Speed gun radar, vert, serving machine, data volley (statistics)
Hudl for video analysis and replay, Volleystation/Volleymetrics/Datavolley/VolleyStation (with R/Shiny) for analysis, Catapult for load monitoring, force plates for jump/power testing
Power measurement in fitness, VERT in training
HUDL/Volleymetrics - Video Breakdown, Sport Attack - Serving Gun

Respondents were then given a list of volleyball apparatus and asked to rate each apparatus' importance in relation to being integral to the preparation of high-performance national teams as

shown in ***Figures 4(a) & 4 (b)***. The results identified the volleyball attack machine as extremely important with 71% of the respondents giving a rating of "extremely important". Other apparatus deemed "extremely important" and/or "important" with a combined rating of close to 50% included adjustable target nets and target challengers for setters/passers as well as the vertical jump trainers and plyometric jump boxes. However, one of the respondents believed all the listed apparatus/volleyball technology to be especially important in the developmental phases for athletes but not necessarily for high performance at the national team level. The respondent stated, "*The first 7 items are important but in the development, not in high performance teams."* The respondent identified the speed gun radar, vert, serving machine and data volley (statistics) as important for high performance teams.

Figure 4 (a): Ratings of Volleyball Apparatus, Training Aids/Technology

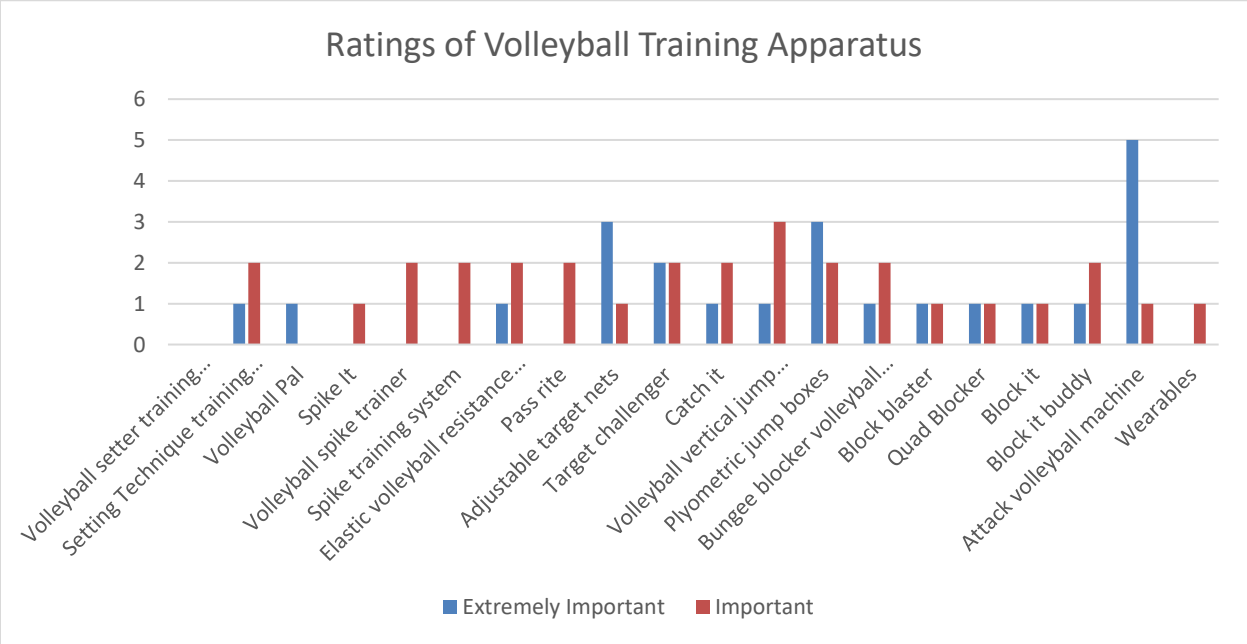
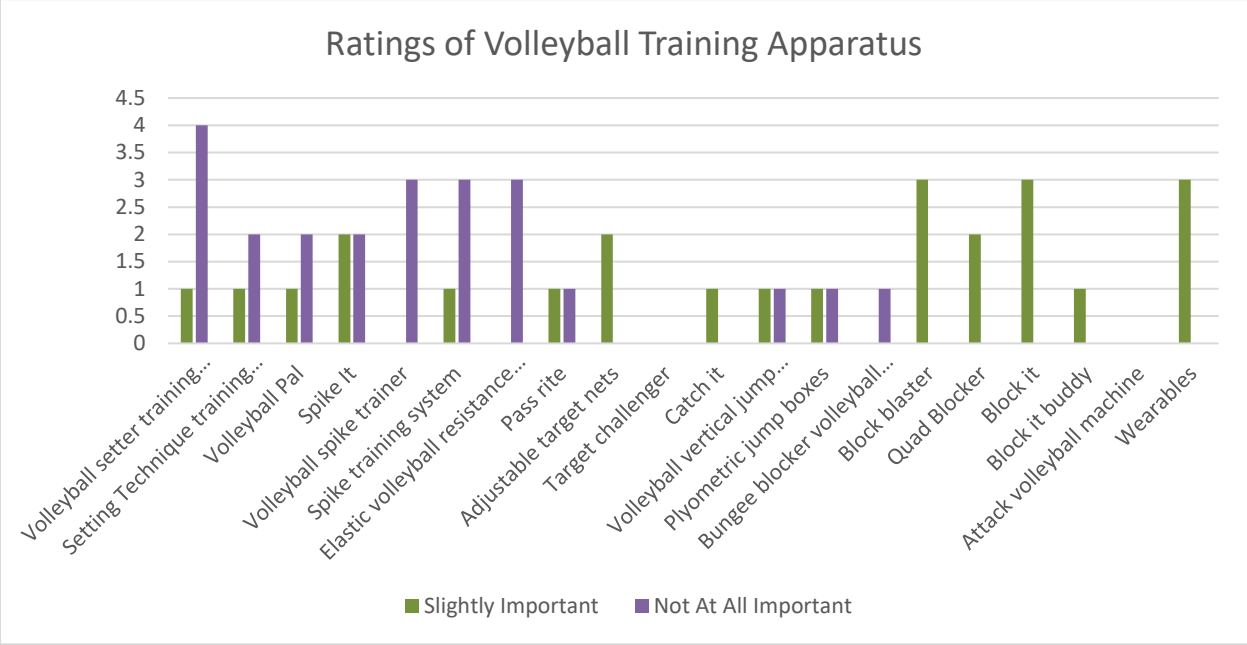


Figure 4 (b): Volleyball Apparatus, Training Aids/Technology Supported & Used



The following apparatus and volleyball technology were deemed not essentially or slightly important by 70% of respondents or more (5 or more): setter training gloves, volleyball pal, spike it, volleyball spike trainer, spike training system, pass rite, black blaster, quad blocker, block it and wearables.

It was also notable that one of the European respondents indicated they were not familiar with most of the technology listed.

When asked what other resources are necessary for the use of volleyball apparatus, training aids, or technology to be beneficial, over 85% (6 or more) of respondents indicated as Extremely Important access to financial resources (6), expertise of coaches/trainers (7), frequency of training (6), and attitudes of players towards training (7). Expertise of coaches and trainers was the only factor that receive 8 votes between Extremely Important and Important.

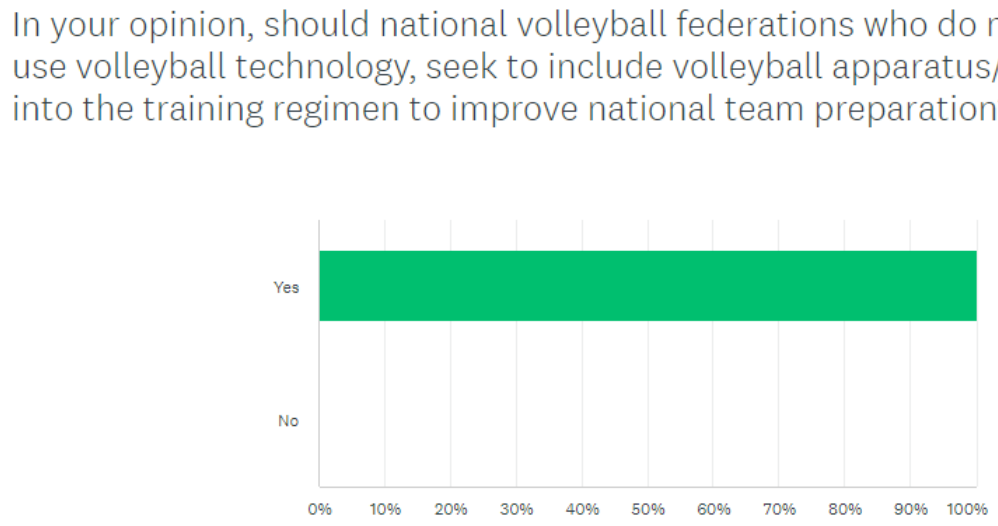
Additionally, one respondent stated, "*Matches and championships frequency. It is important to play a lot."* The respondent believed this to be another factor that influenced team preparation and level of performance. Full results are listed in ***Figure 5***.

Figure 5: Resources Which Are Necessary For The Use of Volleyball Technology To Be Beneficial

	EXTREMELY IMPORTANT	IMPORTANT	SLIGHTLY IMPORTANT	NOT AT ALL IMPORTANT
Access to facilities	83.33% 5	16.67% 1	0.00% 0	0.00% 0
Access to financial resources	85.71% 6	14.29% 1	0.00% 0	0.00% 0
Frequency of training	85.71% 6	14.29% 1	0.00% 0	0.00% 0
Expertise of coaches/trainers	100.00% 7	14.29% 1	0.00% 0	0.00% 0
Knowledge of how to use technology and apply to training	71.43% 5	28.57% 2	0.00% 0	0.00% 0
Training support for coaches and technical staff	42.86% 3	42.86% 3	14.29% 1	0.00% 0
Attitudes of players towards training	100.00% 7	0.00% 0	0.00% 0	0.00% 0
Training regimen	71.43% 5	28.57% 2	0.00% 0	0.00% 0
Part-time vs professional athlete status	28.57% 2	42.86% 3	14.29% 1	14.29% 1
Sports culture within the country	42.86% 3	42.86% 3	14.29% 1	0.00% 0

The results were unanimous that respondents believed national volleyball federations which do not currently use volleyball technology should seek to include its use into the training regimen to improve national team preparation as demonstrated in ***Figure 6*** below.

Figure 6: Should National Federations Include Volleyball Technology In National Team Training Regimen



The final survey question asked, "*What advice would you give to smaller volleyball federations such as Barbados that seek to enhance team preparation in order to have a better performance on the international stage?*" Responses included,

"*To build high performance centre for new talents and invite high level coach*."

"*Creating a training system for young players. Without well-trained players, modern technologies have no meaning.*"

"*Search for international contacts, training camps outside of Barbados together with higher level teams.*"

"*Focus on the volleyball development, create as much competition as you can.*"

"*Be judicious. Start small and focus on effective utilization. For example, master the use of digital video for scouting, match/training review, and feedback.*"

"*Culture is the foundation. Everything starts with your athletes: if/when they buy into your film sessions, training regime, etc.*"

CHAPTER 5.0 DISCUSSION OF RESEARCH RESULTS & RECOMMENDATIONS

Based on the results, volleyball technology is widely supported by those who responded. The use of the volleyball attack machine was identified as an important apparatus for the preparation of national teams. Respondents also favoured the use of video analysis technology which allowed coaching, support staff and athletes to not only analyse the techniques and style of play of the team but allowed for analysis of opponents as well. Two such technologies specified by respondents included Hudl and DataProject.

Other types of apparatus suggested for the developmental levels included adjustable target nets and target challengers for setters/passers as well as the vertical jump trainers and plyometric jump boxes. The use of the aforementioned apparatus would allow the younger national team members and/or trialists, specifically the Youth & Junior teams to improve their skills, accuracy and physical abilities before reaching the more senior levels.

In terms of other resources and/or factors necessary to fully leverage the use of training aids/technology, above 85% of respondents indicated access to facilities and financial resources, frequency of training, expertise of coaches/trainers and attitudes of players towards training.

In order to acquire and maintain the use of any technology, it is paramount that any federation has access to financial resources as this is needed to continue to purchase and train support staff as needed. The frequency of training for the athletes, along with their attitudes towards training can lend to improved skill levels as they become more consistent in their techniques, on court play and match readiness etc. Paramount to any training regimen is the expertise of the coaching staff as knowledge and training is improved with time and expertise gained. Experienced

coaches know what is needed, what must be addressed and how to motivate their teams especially in tough situations. Two other factors identified as vital are the training regimen of the teams and the knowledge of how to use technology and apply it to training.

Considering that the Barbados Volleyball Association has made a decision to incorporate the use of volleyball technology, it would be necessary for the training regimen to appropriately and adequately incorporate its use. Currently only two of the identified technology (plyometric jump boxes and vertical jump trainers) are being used but not for the preparation of all the national teams. Support staff should also be trained in the use of the selected technology and how it should be applied to the training regimen in order to receive the most beneficial results.

The types of volleyball training aids/technology most suited for the Barbados context, considering price, accessibility, training required, ease of use and overall practicality

Based on the feedback given from the survey respondents as to the most important types for volleyball training aids/technology for team preparation, the following have been identified:

- ✓ Volleyball attack machine

- ✓ Hudl recording technology

  Sky 250ET

- ✓ Adjustable target nets/target challengers, and

- ✓ Vertical Jump Trainer 

- ✓ Plyometric jump boxes

The Meaning of the Results

The results of the research were somewhat expected and are not unusual as some of the technology identified was designed for the developmental phases of the teaching/learning of volleyball. However, as the Barbados National Team trialists range in age from the very young (age 10) to the more senior players (late twenties to early thirties), many of the players, especially in the Youth and Junior programmes are still in their developmental stages and can benefit from the use of some of the simpler technology/apparatus. The emphasis placed on video recording and analysis

technology, has indicated a greater need for this type of technology along with the more traditional volleyball training apparatus.

The solution to the research problem therefore hinges on acquiring a combination of video recording and analysis technology along with the most pertinent volleyball apparatus as suggested by the research findings (stated above). This blend would not only allow for the improvement of individual technical skills and ability but cater to the growing need to analyse individual, team and opponent skills and play, in order to create a training regimen which would be more beneficial to the overall goal of improved team preparation which should hopefully transcend into better performances.

It is also important to note the need for key or vital resources as these are viewed to have a direct effect on the overall benefits and sustainability to the use of volleyball technology.

Next Steps

The incorporation of volleyball technology within the training regimen for the national teams is expected to strengthen the development of its athletes and build capacity. However, the implementation and sustainability of the project will hinge on the Association's ability to source additional funding for training, maintenance and future purchases.

Project implementation commences with the decision of what technology exists and what is needed within the budget and capacity of coaches. The simpler technology will be used with the younger groups and all other technology will be used with all the national teams as a part of their preparation.

Implications for Volleyball Developmental Programmes (Grassroots Levels)

Since the commencement of the project, the BVA has been contacted by the Ministry of Sports to participate in a community-based outreach programme which provides a one-off $20 000 BDS grant for a project as outlined by the Ministry, ***Appendix 5***. The expectation is for a portion of the grant to be spent on equipment for developmental purposes. It was also indicated in the meeting with the Finance Officer, Mrs. Sabrina Worrell-Wood and Senior Coach, Mr. Ryan Topping that there exists additional funding to purchase equipment if the BVA so desires and sends appropriate documentation e.g. invoices, equipment requests etc. This opportunity allows the BVA to also purchase equipment for developmental purposes, along with the previously identified technology as identified in this research.

CHAPTER 7.0 RECOMMENDATIONS

The research results were used to form the basis for S.M.A.R.T. recommendations and an overall conclusion.

What Equipment To Purchase

Volleyball Technology	Number	Seller/Source	Unit Price US$	Timeline	User Group
Attack II Volleyball Machine	2	Amazon.com	$3, 299.99	Immediately	Seniors & Under 23
Hudl recording technology-Sky 250ET	1	https://www.hudl.com/	$2,699.00	Immediately	All
Tandem Sport Vertical Challenger	2	https://tandemsport.com/	$374.00	Immediately	Youth & Juniors
Plyometric Jump Boxes	10	Amazon.com	$152.99	Immediately	All
Adjustable Target Nets	2	https://tandemsport.com/	$224.99	Immediately	All

The initial recommendation will concentrate on the purchase of volleyball technology for the national teams as outlined in the scope of the research project. This technology will be accessed via the head and/or assistant coaches as desired and identified in their training schedules through liaison with team managers. Access to video recording technology would be restricted to the specific personnel identified, based on training e.g. the Head Coach of the Senior Women and the Beach Programmes.

However, as an opportunity to purchase additional volleyball technology for grassroots and developmental purposes has arisen during the timeline of this research project, the decision has been made by the Barbados Volleyball Association to pursue this opportunity. The initial submission of required documentation has been made to the National Sports Council and the follow-up meeting with its personnel and the 1st Vice President and Assistant Secretary Treasurer (Ms. Julia Broome) has already occurred. A verbal agreement was made to assist in the facilitation of training for coaches and/or identified personnel in the use of video recording equipment, as well as the provision of additional funds, outside of the stipulated $20, 000 BDS to assist with the purchase of volleyball technology for developmental purposes. The additional amount is dependent on the identification of technology and the submission of the relevant invoices from the source(seller). This project is expected to be completed within a six-months phase.

Priority	Recommendation	Action	Lead	Resources	Timescales	Critical success factors
1	Activate funding to purchase recommended volleyball apparatus and technology.	Agreement on the itemised and source of volleyball apparatus to be purchased. Request disbursement of approved funds.	1st Vice-President & Treasurer	Time, Finances	Immediately August 2023	Releasing of funds from NOC Availability of technology required from sources.
2	Make contact with Ministry of Finance to acquire waivers for duties and levies on the purchase of the equipment.	Complete formal request for waiver of duties and taxes on sports equipment. Provide invoices, receipts and any other requested documentation.	1st Vice-President & Secretary	Time	Immediately August 2023	Granting of waiver from Ministry of Finance. (Liaise with the Minister of Sports or Director of the National Sports Council if need.)
3	Liaise with the Ministry of Sport & National Sports Council regarding the storage and safety of the equipment.	Source a storage cage to be housed at the Garfield Sobers Gymnasium in one of the storage rooms.	President & Assistant Secretary Treasurer/Chairperson Youth & Junior Commission	Finances Access to space	Immediately July 2023 (initial meeting held July 13th)	Approval from the Director of Sports of the National Sports Council or the Board of Directors.

Priority	Recommendation	Action	Lead	Resources	Timescales	Critical success factors
4	Contact broker to facilitate the transportation and clearance of the volleyball equipment and technology.	Enter into an agreement with local broker to facilitate the transportation and clearance of the volleyball equipment and technology. Make deposit to broker for services.	1st Vice-President & Treasurer	Finances	Immediately August 2023	Broker agreement completed
5	Order & purchase the volleyball equipment and technology.	Order & purchase technology from predetermined sources.	1st Vice-President & Treasurer	Finances Time	Once approval and relevant documentation is received from the Ministry of Finance re waiver.	Availability of technology from identified sources. Acceptance of international payment method.
6	Continue dialogue with the National Sports Council & targeted Secondary Schools re Collaboration agreements to improve access to	Identify the phases of the collaboration and party to action each phase e.g. design, funding, construction etc.	Assistant Secretary Treasurer/Chairperson Youth & Junior Commission	Time Finances	Initiated August 2022, continuous	Commitment of all parties (BVA, National Sports Council & Secondary schools)

	facilities for training.					

Priority	Recommendation	Action	Lead	Resources	Timescales	Critical success factors
7	Design and implement an updated training regimen based on the Youth & Junior Volleyball Policy 2022 & BVA Strategic Plan for National Teams.	Complete and implement updated training programme for all national teams.	Chairpersons Selection & Coaches Commissions, National Coaches	Time Personnel	August 2023	Meeting of minds of all parties. Plans aligned to the federation's Strategic Plan for National Teams as well as the Youth & Junior Volleyball Policy 2022.
8	Train coaches and support personnel in the effective use of the volleyball apparatus and technology purchased.	Conduct training seminars/workshops for coaches on the use of the volleyball technology to be employed.	Chairperson Coaches Commission	Resource persons Time Finances Access to internet	Commencement will coincide with the receipt of the volleyball equipment and technology.	Attitudes and willingness of coaches and support personnel towards training.
Priority	**Recommendation**	**Action**	**Lead**	**Resources**	**Timescales**	**Critical success factors**
9	Request additional funding through governmental agencies and NOC (based on the cost to acquire all	Complete request for funding under the Development of National Sports Systems (DNSS)	1st Vice-President & Assistant Secretary Treasurer/Chairperson Youth & Junior Commission	Time Personnel	September 2023	Submission of relevant documentation as requested by NOC. Approval from NOC.

	recommended equipment and coach support training).	programme through the NOC. Submit request for Developmental funding under the Ministry of Sport & Community Development ($20,000 + BDS)			Processed commenced June 30th, 2023	Submission of relevant documentation as requested by National Sports Council (NSC). Approval from NSC.
10	Monitor individual and team progress through collaboration with the University of the West Indies (Cave Hill Campus).	Measure use of technology and progress using predetermined variables/criteria.	Chairpersons Selection & Youth & Junior Commissions	Technology Personnel Finances	Initiate immediately, comparison at the end of a determined time frame.	Agreement with the University stakeholders. Expertise of analytical support staff.
11	Advocate for the establishment of a High-Performance Centre with NOC and relevant governmental agencies.	Propose the establishment of a High-Performance Centre in consultations with the Ministry of Sports & NSC.	President, 1st Vice-President	Finances Location	September 2023	Recognition of NOC, NSC & Ministry of Sports to the importance of a High-Performance Centre to the improved results of local athletes on the international stage.

7.1 BUDGET

Budget for Research Project — EXPENSES

TOTAL EXPENSES	Grant & Funding	Estimated
	$15,000.00	$18,624.88

Equipment Cost	Unit Cost	Price
2 Attack II Volleyball Machines from Amazon	$3,299.00	$6,598.00
1 Sky 250ET Hi Rise Camera	$2,699.00	$2,699.00
2 Adjustable Target Nets	$224.99	$449.98
2 Vertical Jump Trainers	$374.00	$748.00
10 VEVOR Plyometric Platform Box	$152.99	$1,529.90
Total	$6,749.98	$12,024.88

Administrative Costs	Actual Costs	Estimate
Shipping (›10lbs @ › $3.30/lb)		
Taxes (17.5% inclusive of shipping costs)		
Customs & Excise Duties		
Broker Fees		
Transportation from Broker		
Total		$5,000.00

**Note the actual amounts re administrative costs will only be known once the equipment has been purchased and processed at the B'dos Port.

Training For Staff	Actual Costs	Estimate
Resource personnel for training	$500.00	$500.00
Rental of facility for training	$600.00	$600.00
Total	$1,100.00	$1,100.00

Miscellaneous	Actual Costs	Estimate
Contingencies		$500.00
Total	$0.00	$500.00

* **Please note the above budget is stated in US $.**

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Appendices

Appendix 1

Work Plan

What do we want to know?	Indicators	Source	Method	Schedule	How will data be analysed and interpreted?
Types of sports technology are available for the preparation of volleyball athletes	Scholarly works, articles, books etc.	Knowledge of Existing Literature	Questionnaires	Sept. 14th – November 14th, 2022	Thematic
The most impactful volleyball training aids/technology to improve team performance	Selection by > 85% of survey respondents	Knowledge of Existing Literature Survey Respondents	Questionnaires	February 2023 – June 30th, 2023	Thematic & Descriptive Statistics
Necessities to fully leverage the capabilities of the training aids/technology	Indicated by survey respondents	Survey Respondents	Questionnaires	February 2023 – June 30th, 2023	Thematic & Descriptive Statistics
Volleyball training aids/technology are most suited for the Barbados context	Based on data analysis & budget	Data Analysis	Research Recommendations	June 30th, 2023	Relevancy

Stakeholders' Analysis

Appendix 2

Stakeholder	Stake in the project	Potential impact on Project	Perceived attitudes and/or risks	Stakeholder Management Strategy	Responsibility
The Barbados Volleyball Association	Procured financing for project	High	Supportive of project	Implement & monitor the project	Project Supervisor/Owner
Barbados Olympic Association (NOC)	Facilitators of project through financing	High	Supportive of developmental initiatives of federations.	Monitor the use of funds allocated and benefits of project.	Financing the project/Sponsor
National Sports Council	Assist with the financing of project and provision of facilities.	High	Encourages initiatives that are design to promote the development of sports and athletes.	Assist with project implementation and storage of equipment.	Financing the project/Sponsor Provision of facilities & storage for equipment.
Ministry of Sports Barbados	Assist with waivers of duties and taxes.	Medium	Supportive	Facilitate dialogue between federation and Ministry of Finance.	Provision of adequate guidance and liaise with Ministry of Finance.
Athletes	Benefit from the use of technology. Improved performance.	High	Supportive	Buy-in needed to impact success of its use.	Use technology to improve performance
Coaches & Support Staff	Facilitators and expertise for implementation	High	Willingness to be trained, supportive of project	Publicity and education programmes	Use technology and monitor progress made by athletes

2023-01-22

Appendix 3

Dear Respondent,

Thank you for agreeing to complete this survey https://www.surveymonkey.com/r/SZDBBHS regarding the use of Volleyball Apparatus, Training Aids and/or Technology to Enhance the Preparation of National Teams. It seeks to obtain the opinions of administrators, coaches and technical directors with regard to this topic and should take about ten (10) minutes to complete.

This research is being undertaken as part of an Executive Masters in Sports Organisation Management (MEMOS XXV), organised by the International Olympic Committee, and facilitated by the School of Human Kinetics, Faculty of Health Sciences, University of Ottawa.

Please be assured that all of your responses will be treated with the highest level of confidentiality and all data generalised.

Thank you for your time and assistance. Should I have any follow-up questions, I hope you are willing to have a follow-up conversation. Should you require more information about the study, please feel free to contact me at the email address below.

Yours faithfully,

J Broome

Julia Broome

jbroo064@uottawa.ca

The Use of Volleyball Training Aids/Apparatus and Technology To Enhance National Team Preparation & Performance

Thank you for completing this survey. All results will remain confidential.

* 1. Your position title in sports organization

* 2. How many years have you been involved with the preparation of volleyball national teams as an administrator/manager/coach?

* 3. What three (3) key factors do you believe are important to national team success?

Most important factor to success

2nd most important factor

3rd most important factor

* 4. What types of volleyball apparatus, training aids and/or technology have you supported or used for the preparation of national teams?

* 5. What is your federation's position on the use of volleyball apparatus, training aids and technology to enhance the standard of team preparation?

- ◯ Very supportive
- ◯ Moderately supportive
- ◯ Slightly supportive
- ◯ Not at all supportive

* 6. What types of apparatus, training aids and/or technology has your federation identified as integral to the preparation of national (high-performance) teams?

	Extremely important	Important	Slightly important	Not at all important	Not familiar with this technology
Volleyball Setter Training Gloves	○	○	○	○	○
Setting Technique Training Aid	○	○	○	○	○
Volleyball Pal	○	○	○	○	○
Spike It	○	○	○	○	○
Volleyball Spike Trainer	○	○	○	○	○
Spike Training System	○	○	○	○	○
Elastic Volleyball Resistance Belt Set	○	○	○	○	○
Pass Rite	○	○	○	○	○
Adjustable Target Nets	○	○	○	○	○
Target Challenger	○	○	○	○	○
Catch It	○	○	○	○	○
Volleyball Vertical Jump Trainer	○	○	○	○	○
Plyometric Jump Boxes	○	○	○	○	○
Bungee Blocker Volleyball Blocking Tool	○	○	○	○	○

Block Blaster	◯	◯	◯	◯	◯
Quad Blocker	◯	◯	◯	◯	◯
Block It	◯	◯	◯	◯	◯
Block It Buddy	◯	◯	◯	◯	◯
Attack Volleyball Machine	◯	◯	◯	◯	◯
Wearables	◯	◯	◯	◯	◯

Other (please specify)

* 7. What other resources are necessary for the use of such volleyball apparatus, training aids and/or technology to be beneficial?

	Extremely important	Important	Slightly important	Not at all important
Access to facilities	☐	☐	☐	☐
Access to financial resources	☐	☐	☐	☐
Frequency of training	☐	☐	☐	☐
Expertise of coaches/trainers	☐	☐	☐	☐
Knowledge of how to use technology and apply to training	☐	☐	☐	☐
Training support for coaches and technical staff	☐	☐	☐	☐
Attitudes of players towards training	☐	☐	☐	☐
Training regimen	☐	☐	☐	☐
Part-time vs professional athlete status	☐	☐	☐	☐
Sports culture within the country	☐	☐	☐	☐

Other (please specify any other resources to consider)

* 8. In your opinion, should national volleyball federations who do not currently use volleyball technology, seek to include volleyball apparatus/technology into the training regimen to improve national team preparation?

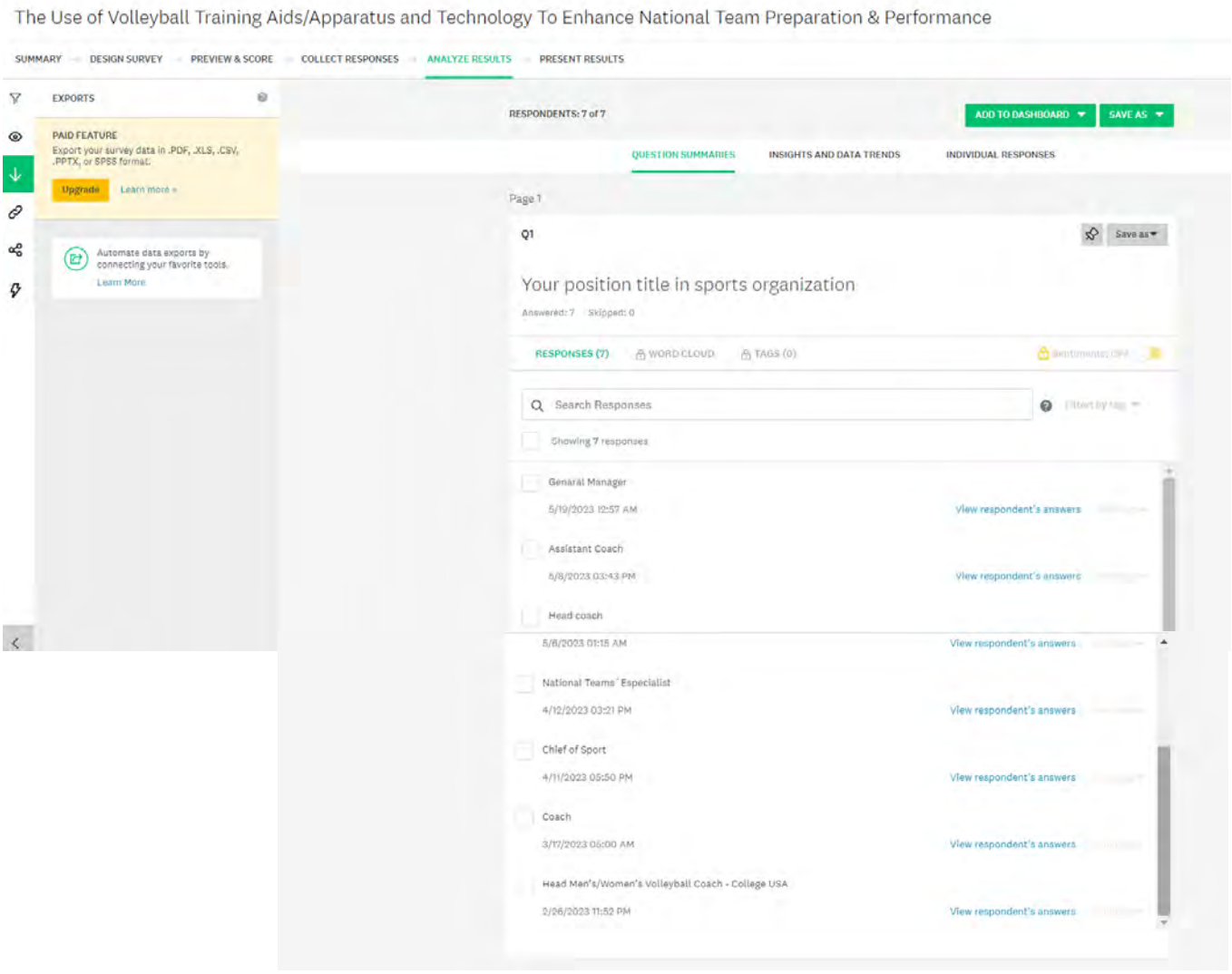
- ◯ Yes
- ◯ No

Please provide explanation for your response above.

* 9. What advice would you give to smaller volleyball federations such as Barbados that seek to enhance team preparation in order to have a better performance on the international stage?

Done

Survey Summary



Q2

Save as

How many years have you been involved with the preparation of volleyball national teams as an administrator/manager/coach?

Answered: 7 Skipped: 0

RESPONSES (7) WORD CLOUD TAGS (0) Sentiments: OFF

Search Responses Filter by tag

Showing 7 responses

6	5/19/2023 12:57 AM	View respondent's answers
15	5/8/2023 03:43 PM	View respondent's answers
18	5/6/2023 01:15 AM	View respondent's answers
8 years	4/12/2023 03:21 PM	View respondent's answers
4	4/11/2023 05:50 PM	View respondent's answers Add tags
10 years	3/17/2023 05:00 AM	View respondent's answers Add tags
20+ Years at The College Level	2/26/2023 11:52 PM	View respondent's answers Add tags

Q3

Save as

What three (3) key factors do you believe are important to national team success?

Answered: 7 Skipped: 0

ANSWER CHOICES		RESPONSES	
Most important factor to success	Responses	100.00%	7
2nd most important factor	Responses	100.00%	7
3rd most important factor	Responses	100.00%	7

Q4

Save as

What types of volleyball apparatus, training aids and/or technology have you supported or used for the preparation of national teams?

Answered: 7 Skipped: 0

RESPONSES (7) WORD CLOUD TAGS (0) Sentiments: OFF

Search Responses

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Showing **7** responses

Serve machine, VERT - for phyisical preperation, DataProject scouting, setters rings, blocking machine

5/19/2023 12:57 AM View respondent's answers

camera, computer, data volley program

5/8/2023 03:43 PM View respondent's answers

Depending on local conditions, vidéo and statistics very important

5/6/2023 01:15 AM View respondent's answers

Speed gun radar, vert, serving machine, data volley (statistics)

4/12/2023 03:21 PM View respondent's answers

Hudl for video analysis and replay, Volleystation/Volleymetrics/Datavolley/VolleyStation (with R/Shiny) for analysis, Catapult for load monitoring, force plates for jump/power testing

4/11/2023 05:50 PM View respondent's answers Add tags

Power measurement in fitness, VERT in training

3/17/2023 05:00 AM View respondent's answers Add tags

HUDL/Volleymetrics - Video Breakdown, Sport Attack - Serving Gun

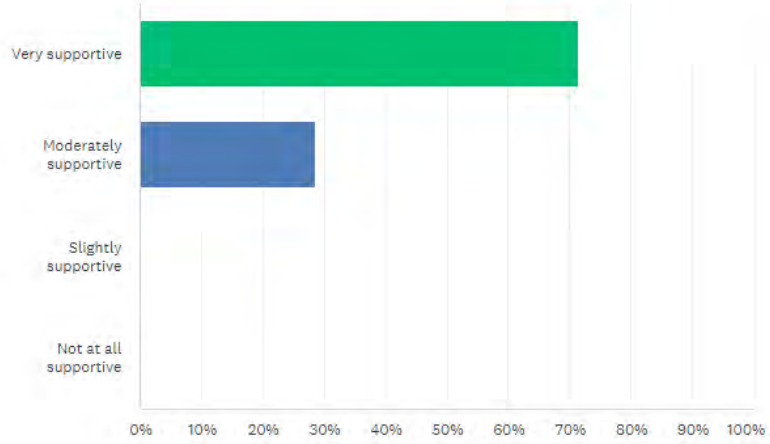
2/26/2023 11:52 PM View respondent's answers Add tags

Q5

Customize Save as

What is your federation's position on the use of volleyball apparatus, training aids and technology to enhance the standard of team preparation?

Answered: 7 Skipped: 0



ANSWER CHOICES	RESPONSES	
Very supportive	71.43%	5
Moderately supportive	28.57%	2
Slightly supportive	0.00%	0
Not at all supportive	0.00%	0
TOTAL		7

Q6

Customize | Save as

What types of apparatus, training aids and/or technology has your federation identified as integral to the preparation of national (high-performance) teams?

Answered: 7 Skipped: 0

	EXTREMELY IMPORTANT	IMPORTANT	SLIGHTLY IMPORTANT	NOT AT ALL IMPORTANT	NOT FAMILIAR WITH THIS TECHNOLOGY	TOTAL RESPONDENTS
Volleyball Setter Training Gloves	0.00% 0	0.00% 0	14.29% 1	57.14% 4	28.57% 2	7
Setting Technique Training Aid	14.29% 1	28.57% 2	14.29% 1	28.57% 2	14.29% 1	7
Volleyball Pal	14.29% 1	0.00% 0	14.29% 1	28.57% 2	42.86% 3	7
Spike It	0.00% 0	16.67% 1	33.33% 2	33.33% 2	16.67% 1	6
Volleyball Spike Trainer	0.00% 0	28.57% 2	0.00% 0	42.86% 3	28.57% 2	7
Spike Training System	0.00% 0	28.57% 2	14.29% 1	42.86% 3	14.29% 1	7
Elastic Volleyball Resistance Belt Set	14.29% 1	28.57% 2	0.00% 0	42.86% 3	14.29% 1	7
Pass Rite	0.00% 0	28.57% 2	14.29% 1	14.29% 1	42.86% 3	7
Adjustable Target Nets	42.86% 3	14.29% 1	28.57% 2	0.00% 0	14.29% 1	7
Target Challenger	28.57% 2	28.57% 2	0.00% 0	0.00% 0	42.86% 3	7
Catch It	14.29% 1	28.57% 2	14.29% 1	0.00% 0	42.86% 3	7
Volleyball Vertical Jump Trainer	14.29% 1	42.86% 3	14.29% 1	14.29% 1	14.29% 1	7
Plyometric Jump Boxes	42.86% 3	28.57% 2	14.29% 1	14.29% 1	0.00% 0	7
Bungee Blocker Volleyball Blocking Tool	14.29% 1	28.57% 2	0.00% 0	14.29% 1	42.86% 3	7
Block Blaster	14.29% 1	14.29% 1	42.86% 3	0.00% 0	28.57% 2	7
Quad Blocker	14.29% 1	14.29% 1	28.57% 2	0.00% 0	42.86% 3	7
Block It	14.29% 1	14.29% 1	42.86% 3	0.00% 0	28.57% 2	7
Block It Buddy	14.29% 1	28.57% 2	14.29% 1	0.00% 0	42.86% 3	7
Attack Volleyball Machine	71.43% 5	14.29% 1	0.00% 0	0.00% 0	28.57% 2	7
Wearables	0.00% 0	14.29% 1	42.86% 3	0.00% 0	42.86% 3	7

Comments (2)

Q7

Customize Save as

What other resources are necessary for the use of such volleyball apparatus, training aids and/or technology to be beneficial?

Answered: 7 Skipped: 0

	EXTREMELY IMPORTANT	IMPORTANT	SLIGHTLY IMPORTANT	NOT AT ALL IMPORTANT	TOTAL RESPONDENTS
Access to facilities	83.33% 5	16.67% 1	0.00% 0	0.00% 0	6
Access to financial resources	85.71% 6	14.29% 1	0.00% 0	0.00% 0	7
Frequency of training	85.71% 6	14.29% 1	0.00% 0	0.00% 0	7
Expertise of coaches/trainers	100.00% 7	14.29% 1	0.00% 0	0.00% 0	7
Knowledge of how to use technology and apply to training	71.43% 5	28.57% 2	0.00% 0	0.00% 0	7
Training support for coaches and technical staff	42.86% 3	42.86% 3	14.29% 1	0.00% 0	7
Attitudes of players towards training	100.00% 7	0.00% 0	0.00% 0	0.00% 0	7
Training regimen	71.43% 5	28.57% 2	0.00% 0	0.00% 0	7
Part-time vs professional athlete status	28.57% 2	42.86% 3	14.29% 1	14.29% 1	7
Sports culture within the country	42.86% 3	42.86% 3	14.29% 1	0.00% 0	7

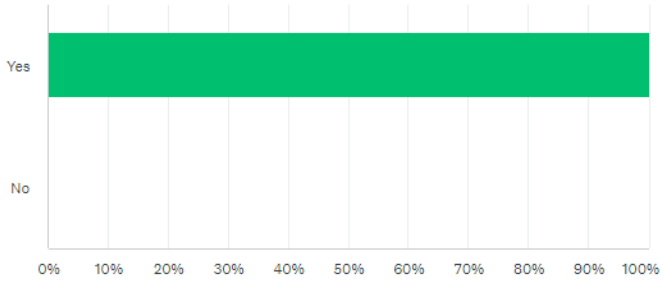
Comments (1)

Q8

Customize | Save as

In your opinion, should national volleyball federations who do not currently use volleyball technology, seek to include volleyball apparatus/technology into the training regimen to improve national team preparation?

Answered: 7 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes	100.00%	7
No	0.00%	0
TOTAL		7

Comments (5)

RESPONSES (5) | WORD CLOUD | TAGS (0) | Sentiments: OFF

Search Responses | Filter by tag

Showing 5 responses

I think modern volleyball and coaching is not anymore imagnable whitout new volleyball technologies. These things hels improve individual performance of the players in specific volleyball elements and also make trainings more interesting for players.

5/19/2023 12:57 AM View respondent's answers

If enough financial resources, but before material better spend money for travelling and international games

5/6/2023 01:15 AM View respondent's answers

Because we need to have data in order to compare where we are to where we want to be. Also, we can work most effectively based on collected information from our teams and opponents.

4/12/2023 03:21 PM View respondent's answers

However, technology is *not* necessarily a deciding factor in a National Team's ability to train or compete effectively

4/11/2023 05:50 PM View respondent's answers Add tags

The only way to be successful is to be better prepared than your opponent

3/17/2023 05:00 AM View respondent's answers Add tags

Q9

Save as

What advice would you give to smaller volleyball federations such as Barbados that seek to enhance team preparation in order to have a better performance on the international stage?

Answered: 7 Skipped: 0

RESPONSES (7) WORD CLOUD TAGS (0) Sentiments: OFF

Search Responses

Filter by tag

Showing **7** responses

To build high performance center for new talents and invite high level coach.

5/19/2023 12:57 AM View respondent's answers

Creating a training system for young players. Without well-trained players, modern technologies have no meaning.

5/8/2023 03:43 PM View respondent's answers

Search for international contacts, training camps outside of Barbados together with higher level teams

5/6/2023 01:15 AM View respondent's answers

Focos on the voleyball development, create as much competition as you can.

4/12/2023 03:21 PM View respondent's answers

Be judicious. Start small and focus on effective utilization. For example, master the use of digital video for scouting, match/training review, and feedback

4/11/2023 05:50 PM View respondent's answers Add tags

Find a good coach who can inspire people (maybe you have already :)

3/17/2023 05:00 AM View respondent's answers Add tags

Culture is the foundation. Everything starts with your athletes: if/when they buy into your film sessions, training regime, etc

2/26/2023 11:52 PM View respondent's answers Add tags

NATIONAL SPORTS COUNCIL
GET MOVING...GET ACTIVE...GO SPORTS

Garfield Sobers Sports Complex
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P.O. Box 70WR/Welches Road

Tel: 535-9601
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Email:nsc.bdos@barbados.gov.bb

Our Reference: /332
Chairman: Mr. McDonald Fingall
Director: Mr. Neil Murrell

Your Reference:
Letter No.:
Date: 1st June 2023

To: Presidents, National Sporting Federations

Dear Sir/Madam:

Re: Financial Assistance for Community Development

Further to the Minister's meeting of Saturday 29th April 2023 with the National Federations, and his subsequent announcement in Parliament on 30th May 2023, the following conditions are required to access the one-off payment of twenty thousand ($20,000.00), for the above captioned subject.

Federations are required to submit the below documents by **30th June 2023**, for disbursement of the above-mentioned amount.

i) Constitution of the Federation
ii) A current Financial Statement
iii) The Development Plan - which should be completed with the following information:

a) Player Development
- Attracting and developing players at all levels in the schools and communities and how this will be done.

b) Community Coaches
- Coach education.
- Increased number of coaches.

2/....

c) **Equipment**
   - How/where the equipment for the programme will be stored.

d) **Scheduling**
   - Training/competitions.

e) **Structure**
   - Indicate the person(s) responsible for this developmental programme and who will facilitate the updates of the programme.

f) **Duration**
   - The programe must be for a period of six (6) to nine (9) months.

The Development Plan, on submission, will be reviewed by the National Sports Council (NSC) to ensure its viability. If the required standards are not met, the NSC will liaise with the Federation to discuss improvements.

After the Plan is approved, the funds will be disbursed in a week's time.

The NSC looks forward to receiving the above.

Yours faithfully

.....

Neil Murrell
Director of Sports
National Sports Council