Comparing Practices of US Volleyball Systems against a Global Model for Integrated Development of Mass and High Performance Sport

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Abstract

This study examines the current state of volleyball in the USA against a heuristic model for high performance sport integrated with mass participation. A questionnaire was utilized for the following elements of the model: talent development; advanced athlete support; training centers; competitions; intellectual services; partnerships with supporting agencies; balanced and integrated funding; and structures of mass and elite sport. Twelve international experts including executives from sport governing bodies, coaches, academicians, and administrators, validated survey questions. 131 coaches completed the questionnaire in order to determine the areas for improvement for US volleyball systems. Possible advancements were identified through semi-structured discussions with seven volleyball administrators. Results suggested possible enhancements at macro-level (e.g., improved revenue and partnership structures for more developmental programs, especially for boys), meso-level (e.g., additional sources and models for better coach education and more facilities), and micro-level (e.g., lifelong healthy participation guidelines and conditions).

Key words: Volleyball, high performance, mass participation

Introduction

Invented in 1895 in Springfield, Massachusetts, volleyball is now the second most popular sport globally behind soccer among participation sports. According to Volleyball World Wide (2016), volleyball is played by over 800 million people worldwide, and it is continuing to develop in the US. By 2014-15, competitive volleyball had grown to be the top team sport for girls in US high schools, surpassing basketball for the first time (Johnson, 2015). The National Collegiate Athletic Association (NCAA) added a Division III Men's Indoor National Championship in 2012, while NCAA Division I Beach Volleyball became a championship sport in just five years. It became the fastest sport to complete the transition from Emerging Sport status to participating in a national championship in NCAA history (AVCA, 2016). The American Volleyball Coaches Association (AVCA) has also grown its membership from 3,200 in 2006 to over 7,000 in 2016 (AVCA, 2016).

National governing bodies (NGBs) have an impact on volleyball at the high performance (HP) level in the US, with success on the beach, indoor, and Paralympic teams. US beach volleyball players have earned more Olympic gold medals than any other country (USA Volleyball, 2017). The US indoor women's team earned two silver medals and a bronze at the last three Olympics, while the men's indoor team earned gold at the 2008 Olympic Games, finished fourth in 2012, and third in 2016 Olympics. The Paralympic performance has shown success with the US women winning their first gold Olympic medal in 2016 (USA Volleyball, 2017). The success of the volleyball at a HP level has brought more attention to sport, which can help its development at lower levels (elementary school, high school, and collegiate) and increase its popularity nationally. Therefore, US HP volleyball has the potential for further advancement, particularly when supported by large pools of mass participants, which was explored by this study.

Recognizing USA Volleyball's (USAV) challenges in achieving its core objectives in building its participation base while achieving competitive success, this study examines the current state of competitive volleyball against a heuristic global model for HP sport development that integrates mass participation (Smolianov & Zakus, 2008, 2009). Referencing domestic and global practices, particularly from healthy nations successful in sport, could provide information on what could be "best practice" in the USA to advance performance and participation structures, processes and programs (Sparvero, Chalip, & Green, 2008). The authors built the model of integrated elite and mass sport development from past research and formed the foundation for a questionnaire and interview schedule for US volleyball coaches and administrators to generate a snapshot of perceptions of the current sport system and possibilities for its further development.

Theoretical Framework

The Smolianov and Zakus (2008) model emerged from the integration of instruments that were used to analyze and compare national elite sport systems (Baumann, 2002; De Bosscher, De Knop, Van Bottenburg & Shibli, 2006; Digel, 2002; Green & Oakley, 2001). The model has been previously validated (Smolianov & Zakus, 2009), and has been shown to be a framework for program analysis that is not culturally bound. It has recently been accepted as a model for further understanding different sport systems including US rugby, tennis, and soccer (Smolianov, Zakus, & Gallo, 2014), swimming (Smolianov et al., 2016), ice hockey (Zeeuw, Smolianov, Dion & Schoen, 2017), Dutch swimming (Zeeuw, Smolianov, & Bohl, 2016) and Nigerian football (Kaka'an, Smolianov, Koh Choon Lian, Dion, & Schoen, 2018). As part of these studies, over 30 US and 20 international coaches who also served as administrators, including leaders of state volleyball associations from parts of the US, critiqued and refined the model. The authors offer this newer version and supporting research data as a heuristic typology for which current and future systems, structures, and practices at the macro-, meso-, and micro-levels of delivery can be measured and compared. This heuristic model differs in that it incorporates what is identified as the "best practice" at each level of current and past sport development systems. It is very much a commingling of Eastern (China, the former USSR, the

former East Germany) and Western (US, British, Commonwealth, European) systems. The model incorporates practices of Eastern European nations not emphasized previously, such as affordable access to high quality coaching, facilities, and events at both mass and elite levels of participation, as well as training and rewarding all participants based on multi-stage scientifically developed methodologies (Farrey, 2018; Fetisov, 2005; Isaev, 2002; Matveev, 2008; Platonov, 2010; Tumanian, 2006).

This study's theoretical framework builds on the scholarship of Bravo, Orejan, Vélez, and López (2012); De Bosscher and associates (2006); Digel (2005); Fetisov (2005); Platonov (2010); and Smolianov & Zakus (2008, 2009), who discussed the foundational role of broad sport participation leading to the development of elite athletic performances. A key idea in this process of developing participants from recreation to HP involves macro-, meso-, and micro-levels of policy and support (see Figure 1), as adapted from Green and Houlihan (2005), De Bosscher et al. (2006), and De Bosscher, Shibli, Van Bottenburg, De Knop and Truyens (2010). Presently, macro-level elements refer to socio-economic, cultural, legislative, and organizational support for a national sport system by the whole society. The meso-level includes infrastructures, personnel, and services enabling delivery of sport policy. The micro-level consists of operations, processes, and methodologies for development of individual athletes. HP elements overlap at different levels (De Bosscher et al., 2006).

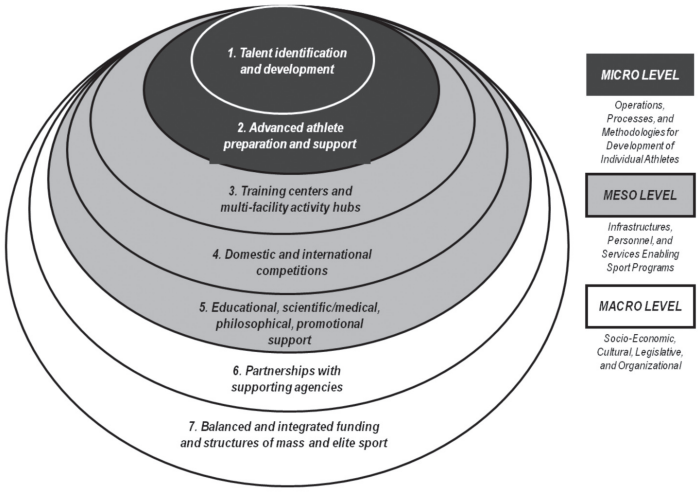

Figure 1. Heuristic Model of Integrated High Performance and Mass Sport Development

When HP (programs preparing athletes for national and international televised competitions) and recreational sport (physical education (PE), recreation and fitness programs) are connected, goals of supporting agencies, ranging from fitness to competitive success and commercial objectives, can be achieved (Fetisov, 2005; Isaev, 2002; Smolianov & Zakus, 2008, 2009). The developed model suggests a globally applicable theory of how to advance HP sport and benefit mass participation. However, sport developers face significant challenges due to insufficient conceptual and practical frameworks, resulting in poorly functioning sport systems (Green, 2005).

Details of the model are based on the literature mentioned above as well as more than 200 sources detailed by Smolianov et al. (2014), showing a wide range of interests in understanding sport development, particularly successful sport systems (Houlihan & Green, 2008; Oakley & Green, 2001; Riordan, 1991; Semotiuk, 1990). Below is an essential explanation of the model.

The micro-level elements one and two in Figure 1 indicate that successful systems for most sports, including volleyball, try to identify talent and gradually develop participants into high performers. These systems follow hierarchical pools of athletes who are rewarded financially and also have increased access to more sophisticated and scientifically-based multidisciplinary performance, career, and lifestyle support.

Effective functioning of the micro-level requires element three in Figure 1, which includes easily accessible, high quality facilities, equipment, and coaching for each age and level of participation. In each community, volleyball could be part of a multi-sport hub where: sports share resources; travel takes little time between home, training and school; and maximum access to medicine and cultural venues. Another important condition for the micro-level is element four in Figure 1; sufficient well-organized competitions at all levels, and the integration of commercial tournaments into a plan of amateur competitions gradually preparing athletes to achieve peak performance at major events. This element also implies that educational, scientific, medical, philosophical, and promotional support (element five in Figure 1) are available at each level of participation.

Provision of the meso-level services results from multiple partnerships (element six in Figure 1) that can obtain sufficient resources and exchange expertise in order to achieve common goals that influence both mass and elite sport environments and society-at-large. Examples include mass media involvement and sponsorship arrangements. Policy may direct the type and nature of systemic organizations required for a holistic sport delivery system in these areas. For a cooperative long term functioning of all these elements, funding and structures of mass and elite sport systems must be balanced and integrated (Element 7 in Figure 1), which relates more to legislative, ideological, and systemic governmental input.

Successful sport systems require macro-level societal support and a balance of funding for elite and mass sport from multiple sources. The following are examples of macro-level services:

1. Mass and HP programs and facilities developed in collaboration with government departments, the nation's Olympic Committee, NGBs, and clubs;
2. Balanced power between the government on one side and NGBs, training centers, clubs, and communities on the other;
3. PE and sport integrated at childcare facilities, schools, and universities;
4. A pyramidal system of sport clubs for each participation level with a dual goal of maximizing participation and developing excellence; progressive participant and coach rewards for fitness and elite performance;
5. A large number of dedicated professional well-trained coaches at all levels; and
6. Subsidization of and incentives for recreational and elite sport ensuring diversity and availability for all.

If HP and recreational sports connect on the above points of development, they can reach goals of supporting agencies. These goals include commercial objectives, positive levels of health and fitness, the various elements of, social capital, and community development, success in major global competitions, and national pride.

Therefore, there is a need to examine the practices of US volleyball organizations against a global model for integrated development of mass and high-performance sport.

Method

Overall Research Design. Mixed research methods were used in this study. A survey of volleyball coaches with open responses accompanied structured or closed questions was implemented first. Then, semi-structured discussions with administrators were conducted. Lastly, a content analysis of the USAV website, organizational documentation, and relevant literature was conducted.

Survey study. Previous theoretical framework and a comprehensive literature review informed the development of a 54-item questionnaire. Items were validated by 12 international experts, including academics who published on HP sport systems and on sport development and executives of sport governing bodies.

Survey participants. A sample of US volleyball coaches and administrators was collected from various sources such as USAV, AVCA, and regional clubs, high schools, colleges and universities nationwide. Of the 2,000 surveys delivered to coaches, 131 completed questionnaires were collected for a response rate of 6.5%. The sample size and response rate were common for a study of this nature. Similar samples were achieved in US rugby, soccer, and tennis (Smolianov et al., 2014), swimming (Smolianov et al., 2016), and ice hockey (Schoen et al., 2016). The average age of the respondents was 48 years, and 115 of the 131 surveyed indicated their gender: only 41 of the respondents were female (White=40, White/Hispanic=1), 74 were male (White=60, Native American=2, White/Hispanic=1, African American=1, Hawaiian=3; Unidentified=7). Over 75% of the respondents identified as white, which highlights the lack of ethnic diversity in the subject pool. The sample of respondents represents volleyball coaches from 30 different states across all regions of the United States, mostly working at mass participation levels of the game (beginner=46.9%, high school=62.3%, regional club=51.5%). Less than 20% of survey participants were HP or college/university coaches. Every participant held at least one certification from USAV or Professional Association of Volleyball Officials (PAVO). Majority of the respondents (89%) held a college/university degree, mostly in education (45%) or PE (30%) and 51% held a master's degree. Out of the 131 coaches, 97% coached female athletes and 31% also worked with boys programs. This sampling of coaches is highly representative of the need for boys programs, indicating a potential demographic volleyball could focus on to increase participation.

Survey data collection. The questionnaire was delivered online via email to 2,000 US volleyball coaches. Survey instructions asked respondents to assess current structures and systems of volleyball in the US and to indicate how often the elements and practices were evident, from 'never' (1) to 'always' (5), on a 5-point Likert Scale. Additionally, they were asked to elaborate on their responses through open-ended written comments.

Survey data analysis. Survey responses were presented as both average scores and aggregated percentages of perceived current practices. Aggregated percentages of responses allow appreciation of the distribution of coach responses. Cronbach's alpha (α) statistic was used to assess the internal consistency of the items used within each element of the model. Cronbach's α is a well-known and well documented (Meyers, Glenn, & Guarino, 2013; Schmitt, 1996; Winand et al., 2010) measure of internal consistency of a set of scale items (i.e., the degree to which the items all point in the same direction). The value of Cronbach's α was consistently reported between 0 and 1, with values toward one indicating more strongly consistent items. Using this statistic to evaluate sport governing organizations, Winand et al. (2010) suggested interpreting Cronbach's α values above 0.4 as "slightly consistent" and those above 0.7 as "consistent." Table 8 illustrates the Cronbach α values for each of the seven elements. The values indicate consistency in each element.

Table 1. *Estimates of Cronbach's Alpha Computed for Each Element of the Model Used in the Study*

Element	Cronbach alpha
Talent Search and Development	.802
Advanced Athlete Support	.751
Training Centers	.795
Competition Systems	.800
Intellectual Services	.870
Partnerships with Supporting Agencies	.721
Balanced and Integrated Funding and Structures of Mass and Elite Sport	.828

Semi-structured telephone interviews. Seven US volleyball administrators (two national, five regional) were interviewed to gather further information regarding the challenges and advancement of US volleyball. The interview questions were based on the seven elements of the model. Five of the seven interviewed administrators were male and two were female, all were White, with the average age of 57 years.

Interview data analysis. Content analysis was conducted on the open-ended comments that reflected the heuristic model for HP and mass participation (Smolianov & Zakus, 2009). Inductive coding techniques followed by researcher discussions led to refinement of themes. The open-ended survey comments were quantified and reported in percentages to specify and prioritize the areas for improvement.

Trustworthiness of qualitative data. Before the instrument was administered, as mentioned above, the questions were validated

through expert examination and correction. Peer debriefing and member checking were also utilized. The triangulation of the findings was achieved by comparing and contrasting the three types of data: coaches' survey scores, open responses by coaches and administrators, and website and organizational documentations. The three types of data served as different measures of the study's theoretical framework and ensured construct validity.

Results

Element 1: Talent Identification and Development

Element 1 had more negative evaluations than other elements of this study, despite its score of 2.8. With ten questions, the scores ranged from 2.2 to 3.3. As seen from Table 2, opinions were divided: 23% of respondents had overall positive perceptions about this element, 38% were negative, and 39% had a neutral perception. Items seven and eight had predominantly negative perceptions (70% and 65%, respectively), consistent with the low average score of 2.2 for each. This revealed that there is not only a shortage of qualified volleyball coaches across participant levels but a lack of financial compensation for experienced coaches. This makes it difficult to nurture each participant using individualized pedagogical and sport science methods desired for this micro-level element.

With 39% neutral responses to Element 1, respondents were uncertain of or not familiar with talent identification and development practices, particularly methods of introducing children to volleyball from outside the sport's participation base. Of the 99 open responses on this element, 38% spoke to quality of coach training and 26% were concerned about training costs being too high.

Table 2. *Talent search and development*

Desired Practices	Average Score	Distribution of Responses: Negative Perceptions* (%)	Neutral Perceptions* (%)	Positive Perceptions* (%)
1. In addition to children being introduced to volleyball by themselves and parents, potential athletes are attracted from outside the sport's participation base (e.g., by a search at schools).	3.0	24	47	29
2. Young volleyball players are trained based on guidelines for multiple development stages recommended by USA Volleyball (many national governing bodies have guidelines for nurturing players from the introduction to sport through the achievement of peak performance on to retirement from sport)	3.0	23	48	29
3. Sufficient resources are available collectively from various supporting organizations for all young talented volleyball players to progress through all developmental stages.	3.2	27	38	35
4. A multi-stage system of athlete qualification based on results/ranking within age groups is used to reward a volleyball player's progress from beginner to top international level.	3.2	24	42	34
5. Performance of volleyball players in each competitive age group is monitored and developed using a national database.	2.6	42	39	19
6. A high number of full-time volleyball coaches are available making the athlete-coach ratio low.	2.5	54	31	15
7. Volleyball coach expertise is equally high across all participant ages and levels.	2.2	70	24	6
8. Volleyball coaches are paid according to multi-level certification based on coaches' education and achievements of entrusted players.	2.2	65	31	4
9. Volleyball players with potential to represent the country (e.g. nation's top 100 athletes per age group) are offered the conditions to train full time with high performance standards.	3.3	19	42	39
10. Volleyball training is well integrated with school/college/ university education for harmonious development of athletes.	2.9	33	43	24
Across all items in element (N=129)	2.8	38	39	23

*Note. Possible scores on questions range from 1 to 5. Negative Perceptions is an aggregation of '1 = never' and '2 = rarely' responses. Neutral Perceptions is an aggregation of '3 = sometimes' and 'Do not know' responses. Positive Perceptions is an aggregation of '4 = often' and '5 = always' responses.

Element 2: Advanced Athlete Support

Element 2, which covers advanced athlete support, had an average score of 3.1. This seemingly positive score compared with the response percentages in Table 3, indicated that this micro-level element was not strongly understood by the respondents. The positive responses (26%) were slightly higher than the negative responses (18%), and over half (56%) of the responses were neutral. Only item six had a significant positive response (53%) reflecting good medical support of elite athletes. In contrast, items one and eight both had a significantly low positive rate of 8% , which was caused by lack of knowledge and provision of athlete career and healthy lifestyle support.

Of the 46 open responses of Element 2, 24.5% of the coaches suggested a need for consistent opportunities at the lower levels of the game. An additional 15.8% agreed there is a lack of financial and supportive resources for volleyball players.

Element 3: Training Centers

Element 3, reflecting meso-level infrastructures, had an average of 2.7 with scores ranging from 2.4 to 3.6. Across all items, the highest response of 51% was from the neutral responses, along with more negative responses (30%) than positive (19%). Though the range within the response scores was small, items one and two were the only two responses with more of a positive than negative perceptions, 45% and 34% respectively.

The first item indicated that elite players have priority access to facilities. The second item indicated that volleyball training centers provide facilities and equipment for all different levels of participation, which were the only two items with more positive than negative responses. The weakest scores seen are in statements three and four, which deals with the availability of advanced training centers and their costs. The lowest score recorded was in response to affordability of facilities, with 44% of negative and only 3% of positive responses. Items five through seven all had a significant negative response to training facilities as well with a 14% response. The overall negative response of most of these items solidifies the concern for lack of available and affordable facilities for all participants. This was also consistent in the 50 open responses collected in the element where there are not enough dedicated volleyball sites for all levels of play.

Table 3. *Advanced Athlete Support*

Desired Practices	Average Score	Distribution of Responses: Negative Perceptions* (%)	Neutral Perceptions* (%)	Positive Perceptions* (%)
1. Athletes, including volleyball players, are supported at places of work similar to those at Hilton and US Army where paid time given to train and compete.	2.4	36	56	8
2. High performance volleyball players are ranked into hierarchical levels/pools with appropriate financial and technical support.	2.9	21	64	15
3. Athletes are assisted with formal education and career outside sport	3.2	20	52	28
4. Athlete support is well shared/balanced between coaches and advisors (e.g., coach may provide psychological, nutritional and performance science support, while independent advisors may best assist with medicine, career, education and personal finances)	3.2	14	56	30
5. Scientific research (e.g., biomechanics of athlete movement and psychophysiological analysis) is applied quickly and effectively to immediately benefit player performance.	3.2	16	53	31
6. A volleyball career is prolonged by medical personnel knowledgeable in volleyball (helping with such things as injury prevention, adjustment of training levels, nutrition, pharmacology, rest and stimulation therapy, doping use prevention).	3.6	10	37	53
7. Doping is controlled by USA Volleyball and is based on the most recent guidelines from the World Anti-Doping Agency.	3.8	8	60	32
8. Athletes leaving elite sport are provided with individualized lifestyle plans for physical and psychological health.	2.6	20	72	8
Across all items in element (N=129)	3.1	18	56	26

*Note. Possible scores on questions range from 1 to 5. Negative Perceptions is an aggregation of '1 = never' and '2 = rarely' responses. Neutral Perceptions is an aggregation of '3 = sometimes' and 'do not know' responses. Positive Perceptions is an aggregation of '4 = often' and '5 = always' responses.

Table 4. *Training Center*

Desired Practices	Average Score	Distribution of Responses: Negative Perceptions* (%)	Neutral Perceptions* (%)	Positive Perceptions* (%)
1. High performance athletes are provided with priority access to specific high quality equipment and facilities	3.6	5	50	45
2. Training centers provide specialized facilities and equipment for each age and level of participation	3.3	18	48	34
3. All national, regional and local training centers are available to athletes at affordable costs	2.4	44	53	3
4. Travel from home to training facilities takes little time for US volleyball players of all levels and types	2.6	38	53	9
5. Training facilities are close to all facilities for athlete support (e.g., school/college, medical, room & board, leisure/entertainment)	2.8	27	59	14
6. A network of training centers is used to prepare US volleyball players in different environments/socio-geoclimates (e.g., high altitude/temperature/humidity, city/pollution, rural/resort)	2.5	45	41	14
7. Volleyball training centers are located close to other sport facilities so that players participate in and learn from other sports	2.5	31	55	14
Across all items in element (N=129)	2.7	30	51	19

*Note. Possible scores on questions range from 1 to 5. Negative Perceptions is an aggregation of '1 = never' and '2 = rarely' responses. Neutral Perceptions is an aggregation of '3 = sometimes' and 'Do not know' responses. Positive Perceptions is an aggregation of '4 = often' and '5 = always' responses.

Table 5. *Competition Systems*

Desired Practices	Average Score	Distribution of Responses: Negative Perceptions* (%)	Neutral Perceptions* (%)	Positive Perceptions* (%)
1. Hosted international events and international opportunities are sufficient for all athletes with potential to represent the country	2.9	32	46	22
2. Competitions are well structured at all levels (e.g., club/training center, regional, and national)	3.6	10	38	52
3. USA Volleyball and its support mechanisms sufficiently assist in local and developmental events	3.2	22	47	31
4. USA Volleyball attempts to integrate professional and amateur tournaments into a progressive plan of competitions gradually preparing athletes for peak performance at "Majors" (i.e., World Cups and Championships, Paralympic and Olympic Games, Masters)	3.6	11	46	43
5. USA Volleyball tries to coordinate all domestic and international competitions for all ages and levels, between and within all possible organizations.	3.4	14	50	36
6. Event sponsorship incomes are used to develop competitions for all participation levels	2.7	20	71	9
Across all items in element (N=129)	3.2	18	50	32

*Note. Possible scores on questions range from 1 to 5. Negative Perceptions is an aggregation of '1 = never' and '2 = rarely' responses. Neutral Perceptions is an aggregation of '3 = sometimes' and 'Do not know' responses. Positive Perceptions is an aggregation of '4 = often' and '5 = always' responses.

Element 4: Competition Systems

Element 4 had a somewhat positive perception with 32% responding positive over 18% responding negatively. With only six items in this meso-level element, the average score was on the higher end of the element scores with 3.2. Over half of the coaches (52%) agreed with statement two that competitions were well structured at all levels. The concerns identified were only in two items, one and six. In item one, just 22% of coaches felt hosted international events and opportunities were sufficient for all athletes with potential to represent the country, while 32% had a negative perception.

Open responses to question six again raised concerns over the understanding of how events receive funding. Despite the small number of open responses for this element (38 comments), the responses regarding competitive systems targeted three areas of concern: financial constraints (23.7%), lack of cooperation amongst the governing bodies in volleyball (21%), and insufficent development at younger ages (18%).

Element 5: Intellectual Services

Element 5 is the strongest of the US volleyball system with an average score of 3.4. The range of responses was the highest of all the elements ranging between 3.0-3.7. Almost half of responses had positive perceptions (43%) toward meso-level intellectual services. Most of the practices rated positively, including items two and three with a 55% positive rating agreeing that USAV fosters research on important aspects of volleyball development, and 49% agreeing that principles of Olympism and sportsmanship have been well communicated. Item four, which was almost equally divided with negative (30%) and positive (29%) responses, highlights that despite the research, the information is not being received by the coaches.

There were 40 comments relating to Element 5, with 30% of the responses concerned with lack of information and communication for athletes at the lower levels. Participants reported that the results from important research studies need to be better communicated to all coaches of the game. Another critical aspect of this element was the level of coach education; 89% of coaches indicated they have a college degree and most survey participants have certification through USAV required to coach the sport at any level (USA Volleyball, 2018).

Element 6: Partnerships with Supporting Agencies

An average score of 2.9 across the six items in Table 7 agrees with views that this macro-level element leaned toward the negative (28%), with just 2% over the positive views. The responses were particularly negative in regards to the lack of governmental support for volleyball development. This is clearly a concern for over half of the coaches (57%), with only 5% responding positively. The areas of greatest concern by commenting coaches are a consistently stated lack of government funding from the youth levels to the Olympic level of the game.

Table 6. *Intellectual Services*

Desired Practices	Average Score	Distribution of Responses: Negative Perceptions* (%)	Neutral Perceptions* (%)	Positive Perceptions* (%)
1. All specialists engaged in the development of volleyball players are well educated for their professional roles.	3.3	13	53	34
2. USA Volleyball fosters research on all-important aspects of volleyball development.	3.7	10	35	55
3. Principles of sportsman like conduct and Olympism are communicated well (e.g., through mass media, school education, and through the arts as part of volleyball events).	3.5	15	36	49
4. Research results are well communicated to coaches (e.g., by research institutes, universities, USA Volleyball).	3.0	30	41	29
5. Communication by USA Volleyball contributes to national values and identity by inspiring participants to strive for excellence, to show the best results and character in the world.	3.5	12	42	46
6. USA Volleyball provides vision and leadership in improving all aspects of the participants' well-being through volleyball (e.g., physical, social, emotional, mental, spiritual, and environmental/ecological).	3.5	14	39	47
Across all items in element (N=129)	3.4	16	41	43

*Note. Possible scores on questions range from 1 to 5. Negative Perceptions is an aggregation of '1 = never' and '2 = rarely' responses. Neutral Perceptions is an aggregation of '3 = sometimes' and 'Do not know' responses. Positive Perceptions is an aggregation of '4 = often' and '5 = always' responses.

Table 7. *Partnerships with Supporting Agencies*

Desired Practices	Average Score	Distribution of Responses: Negative Perceptions* (%)	Neutral Perceptions* (%)	Positive Perceptions* (%)
1. Support for volleyball development is adequate from various levels of government.	2.1	57	38	5
2. Sufficient help is obtained from USA Volleyball and other national governing bodies of volleyball that provide coach education and certification.	3.3	20	37	43
3. Role of clubs/community programs in volleyball development is sound.	3.2	18	49	33
4. Volleyball is well supported by educational sector (e.g., schools, colleges, universities).	3.3	19	43	40
5. Cooperation with agencies outside of sport industry (e.g., medical, scientific, military, philanthropic and sponsoring organizations, lotteries) is in place.	2.8	23	67	10
6. US Volleyball influences media coverage and popularity of volleyball to increase support from the society.	2.9	33	44	23
Across all items in element (N=129)	2.9	28	46	26

*Note. Possible scores on questions range from 1 to 5. Negative Perceptions is an aggregation of '1 = never' and '2 = rarely' responses. Neutral Perceptions is an aggregation of '3 = sometimes' and 'Do not know' responses. Positive Perceptions is an aggregation of '4 = often' and '5 = always' responses.

Table 8. *Balanced and Integrated Funding and Structures of Mass and Elite Sport*

Desired Practices	Average Score	Distribution of Responses: Negative Perceptions* (%)	Neutral Perceptions* (%)	Positive Perceptions* (%)
1. Corporate and philanthropic tax incentives provide sufficient support of mass and elite volleyball players.	2.1	37	60	3
2. Participation in various sports, as a foundation for volleyball development, is encouraged through physical education requirements.	2.8	33	48	20
3. Sport participation, including volleyball, is rewarded with reduced personal tax.	1.3	51	48	1
4. Volleyball programs service both recreational and high performance players.	3.6	12	28	60
5. Specialized sport schools similar to IMG academies are available and affordable to all talented volleyball players.	1.9	58	39	3
6. A multi-stage system of elite volleyball qualification is integrated with a system of fitness tests for mass participation.	2.3	42	49	9
7. Memberships and other "fees" affordable for all are available in various volleyball clubs.	2.7	41	42	17
8. Volleyball participants are diverse as general population.	3.0	39	28	33
9. USA Volleyball demonstrates systematic/strategic management in developing players at every level.	3.2	20	51	29
10. USA Volleyball is effective in fostering both mass participation and high performance in volleyball.	3.3	18	33	39
11. Volleyball is developed in integration with Olympic and Paralympic sports to achieve sustainable competitive excellence.	3.8	9	33	58
Across all items in element (N=129)	2.7	33	43	24

*Note. Possible scores on questions range from 1 to 5. Negative Perceptions is an aggregation of '1 = never' and '2 = rarely' responses. Neutral Perceptions is an aggregation of '3 = sometimes' and 'Do not know' responses. Positive Perceptions is an aggregation of '4 = often' and '5 = always' responses.

There were 44 open comments relating to this element. Coaches and administrators (34%) highlighted the lack of media exposure volleyball receives. Relatedly, 18% believed it is difficult to get sponsorship. Another 16% of respondents mentioned the lack of consistency between the regional governing bodies. This message has been the main theme throughout each element of this study. There is limited television exposure, which puts volleyball at a disadvantage compared to the other major sports in this country.

Element 7: Balanced and Integrated Funding and Structures of Mass and Elite Sport

Element 7 is the macro-level element that also had the largest number of items with 11. The results of this element showed both extreme positive and negative perceptions with the average scores ranging between 1.3 and 3.8 over the 11 items. Despite the range in responses, the average score was 2.7. This indicates consistently negative responses, with the exception of items four and 11. Overall, 33% of coach responses were negative, with only 24% responding in the positively. Item four had the greatest positive response, with 60% of coaches agreeing that volleyball programs serve both recreational and HP players. Item 11 further supports the competitive growth of volleyball with over half of the coaches (58%) agreeing that volleyball was developed in integration with Olympic and Paralympic sports achieving sustainable competitive excellence. With only 9% responding negatively, it is a likely indication that USAV is on the progressive track in this area. When looking at items one, three, five, and six, there was many more negative responses (37%, 51%, 58%, and 42%, respectively) compared to positive responses (3%, 1%, 3%, and 9%, respectively). US volleyball systems are lacking funding opportunities and support from government agencies.

Of the 24 open responses provided for this element, 25% of the coaches indicated that there is a need for more consistent opportunities at the lower levels of participation. Additionally, concerns were raised regarding the need for more expert coaches and lack of financial support, a consistent concern among coaches and administrators through the surveyed elements. Higher-level programs receive the most support from corporate and philanthropic giving, where developmental levels do not benefit from such opportunities. The consistent responses paint a clear picture of the need for improved subsidization of mass volleyball development.

Discussion and Conclusions

Agreeing with similar studies on other US sports (Schoen et al., 2016; Smolianov, Zakus, & Gallo, 2014; Smolianov et al., 2016), the survey of volleyball coaches and administrators highlighted the lack of funding for meso-level mass participation programs and education of coaches at the macro-level. Improved revenue and partnership structures of USAV should allow the funding of more developmental programs, especially with boy's volleyball, ensuring that all coaches are educated based on lifelong healthy micro-level participation guidelines, and providing easier access to more facilities and better support to greater numbers of HP athletes at meso-level across the US. At macro-level, additional resources could support more mass programs. According to USAV's financial reports, 69% of the total annual revenue of $24 million is generated by mass volleyball, but they only receive 48% of expenses. Elite volleyball, on the other hand, contributes an estimated 31% of revenue and receives 52% of expenses (USA Volleyball, 2013). Requiring greater support, mass volleyball contributes $12 million through membership, event, and program payments, compared with $3 million received from sponsors of elite USAV programs. Elite athlete funding also depends on the United StatesOlympic Committee, which relies on unstable income from sales of television broadcast rights, sponsorships, and donations. In the US, unlike most other countries, the National Olympic Committee receives no accountable government funding and must compete for sponsors with professional teams. Greater government incentives and grants provided to US NGBs could be the same as those done by the central Dutch government, which collects public and lottery money to support its sports. The country then directs this funding to sport clubs, NGBs, and most notably to local sport projects, devoting 75% of its total income to mass sport and 25% to elite athletes (Van Bottenburg, 2011). The US government could increase subsidization, reduce taxes, and publically recognize organizations and individuals for achieving volleyball participation and performance objectives.

At meso-level, additional sources and models are needed for better coach education, more facilities, and event implementation. Well-paid and educated US coaches, as valued pedagogues in healthy nations, could better utilize physical activities and achieve success for mass participants. For example, school education in Finland is widely acknowledged as one of the best in the world, where a master's degree is required to start teaching (NCEE, 2014). Also, the systematic coach education supported by government funding has been advancing in different progressive sport countries such as Australia, Canada, Germany, UK, China and Russia (Duffy et al., 2011). By adopting the practices used by the aforementioned countries, USAV could better support its coach education and the promotion of mass volleyball participation in the US. Specifically, USAV could work more closely with universities to help volleyball coaches receive continued education leading to a master's degree, which includes volleyball-specific knowledge as well as competitive volleyball experience which are competencies of coaches graduating from sport universities in countries such as China, Germany and Russia (Digel, 2002, 2005). This coach education could integrate required ongoing certification courses to ensure that US volleyball coaches support the American Development Model.

To create more opportunities for people to play volleyball at all levels, creative solutions need to be researched. Courts could be made on grass in warmer climates. Collaborations with organizations such as YMCAs and Boys' and Girls' Clubs should be increased. Volleyball could be part of more multi-sport facilities such as Olympic Training Centers and IMG academies if USAV increases its collaboration with national governing bodies and educational institutions for shared costs and space. Results of this study agree with the Project Play (2017) report which suggests that schools should open their fields and facilities, offering more places to play in evenings, weekends, and summer months, overcoming the lack of transportation to facilities.

To expand the system of competitions, employees of all public

and private organizations could participate in local and then national events; state governments together with corporations could expand state and national games for more participants and organizational teams. USAV could help public organizations lead private sectors in competing within and amongst organizations and industry sectors, and awarding participants representing different organizations, as well as offering free family competitions for all generations. Elite and mass competitions can be connected through free youth club membership and coaching in preparation to regular contests among districts as done by New York City Parks (2018). Lessons could also be learned from small successful sport nations in history, the former GDR (Gilbert, 1980) and the current Norway (Farrey, 2018). Success could be achieved with limited resources and small populations by using a well-coordinated and efficient approach to support talent individuals focused on their psychological, intellectual, and social needs at micro level of sport development (Farrey, 2018; Gilbert, 1980).

The key methodological implication from this study is that a heuristic model can be developed from a concept into a theory and a model for actionable evaluation of a sport system. This was completed through the following steps lasting for more than a decade:

1. Concept development through multiple reviews of literature analyzing sport systems of different countries;

2. Surveys of coaches and administrators in order to advance systems of different sports in various countries including multiple refinements of the survey model through corrections by coaches and administrators from different countries and sports.

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