VOLLEYBALL PRACTICE SKILLS WITH INTELLIGENT SENSOR TECHNOLOGY MODEL TO DEVELOP ATHLETE'S COMPETENCY TOWARD EXCELLENCE

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ABSTRACT

In this research article, the researcher investigated the skills training process for volleyball players using intelligent sensor technology to develop athletic performance and to achieve the goals or specified criteria. There were three processes in this research. The Volleyball Intelligent Sensor Technology (ViST) Model was evaluated by specialists, which showed that it was consistent and could be used to improve the skills of volleyball players at the highest level. Therefore, the ViST Model process was used to develop an intelligent sensor technology system for volleyball skills training, with a system that could perform training according to a predetermined training program. This allowed volleyball players to practice every time with a robot as a training partner, working according to the training program and acting as both a trainer and a coach. This evaluated the results of the training, suggest-ed procedures, corrected mistakes, and improved the athletes' training, thus making it more effective. The athletes were able to develop their skills at any time, as needed, depending on their availability. Hence, the athletes gained discipline in training and developed their performance and potential quickly.

Keywords: *Practice skills, Competency, Intelligent Sensor Technology, Volleyball*

1. INTRODUCTION

Sport is an exercise, of which the main purpose is to promote good health. Organized sports events can also be entertaining. From a business perspective, sport can also generate income for athletes and for communities as well. Competent athletes can gain good reputations and acceptance from society. They provide pride and self-confidence. On the other hand, sports can also create good relationships in the community, engender feelings of love and unity, refine minds, and make sports participants more generous and forgiving. With the acceptance of losing or winning, valuable people are created for society. The development of sports has created new knowledge in areas such as sports science and a variety of knowledge in subjects such as anatomy, physiology, biomechanics, skills and sports training, sports nutrition, sports psychology, sports medicine, and sports technology.

The Ministry of Tourism and Sports has focused on the development of athletes, sports industries, and sports tourism. Sports excellence can build reputations and create prestige for the country with the success of the country's representative athletes at international sporting events, and by using knowledge and innovation in sports science and sports technology, which are important factors. Sports industries have mostly gained income from football, basketball, volleyball, beach volleyball, tennis, and badminton including all kinds of sporting goods. With learning in sports science, it has become apparent that the development of this area has been very important for the development of the sports industries. Humans can integrate technological knowledge with the knowledge of sports science to promote and develop various sports to meet their objectives.

As mentioned previously, one of the developments in sports science has been the application of information technology systems[1], [2]. It has been found that the students composed sub-elements with information used for their training in volleyball. Another research study related to the use of information technology for practicing volleyball skills was entitled "Sensor system for augmented feedback applications in volleyball". This research conducted a study of the application of

sensor systems in volleyball to ascertain the regulations and solutions to problems with sensor systems. The study obtained the main parameters for analysis from movements in volleyball, instead of using an optical motion tracking system[3]. Today, sensor systems are cheaper and can also detect movements. Therefore, there was sufficient data for analysis in volleyball training. From the results, it was found that the proposed sensor system was suitable for using in a biofeedback application and could help professional volleyball coaches[4].

Developing athletic performance to a level of excellence involved the application of intelligent sensor technology to sports science [5]. The athletes were able to practice without time constraints and the system incorporated an automatic training assessment, including using robots as training partners for athletes for tasks such as throwing balls, collecting balls, etc. These were the key factors in the system that affected the development of the athletes' skills and enabled them to develop the required skills quickly. The features of technology and computer systems could be assigned and it was possible to establish a program to control the athletes' training without human beings, or using them to a lesser extent than previous training. This made the training sessions more stable, accurate, and precise. Moreover, coaches could monitor their training in real-time, as the athletes practiced, even when the coach was not present in the training area. It was also possible to refer back to training records. This enabled the intelligent sensor technology system to develop the performance of the athletes to meet their goals of high performance and gaining an advantage over their competitors, whilst making money for themselves and their communities. Additionally, they were motivated and encouraged people to play sports and exercise to have healthy bodies. Reputations from competitions could also lead their countries to become global sports industry leaders.

2. OBJECTIVES OF RESEARCH

The research objectives are:

- To synthesize the process of training volleyball practice skills with intelligent sensor technology.

- To develop volleyball practice skills with intelligent sensor technology model.

- To evaluate volleyball practice skills with intelligent sensor technology model.

3. RESEARCH HYPOTHESIS

The results of the evaluation of the sports skills training model with intelligent sensor technology has a high level of performance.

4. SCOPE OF THE RESEARCH

4.1 Population and Sample
The research population was five experts in volleyball or sports science and six experts in information technology and communication for education. The research sample comprised eleven experts who have the following qualifications.

(1) Experience as an expert in volleyball or sports science of more than five years or a graduate with a Doctorate of Philosophy.

(2) Experience as an expert in information technology and communication for education who is a Doctor of Philosophy or an Assistant Professor.

4.2 Variables
The independent variable is the volleyball practice skills with intelligent sensor technology model. The dependent variable is a result of evaluating volleyball practice skills with an intelligent sensor technology model.
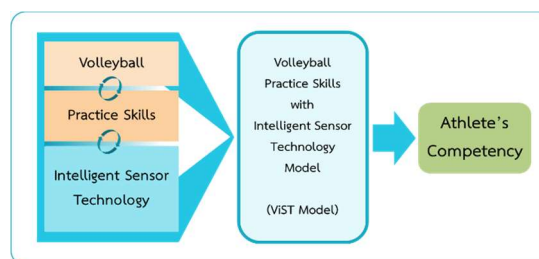
5. CONCEPTUAL FRAMEWORK

Figure 1. Volleyball Practice Skills with Intelligent Sensor Technology conceptual framework.

6. RESEARCH INSTRUMENTS

- The volleyball practice skills with intelligent sensor technology model.

- The Evaluation form of volleyball practice skills with intelligent sensor technology model.

7. DATA COLLECTION

The data collection from the experts proceeded as follows:

Step 1: Invitation letter with attachments submitted to the experts.

Step 2: Response to the invitation letter received from the experts, with attachments.

Step 3: Importing of data and processing of results.

Step 4: The summary of results for the evaluation of volleyball practice skills prepared with an intelligent sensor technology model.

8. LITERATURE REVIEW

8.1 Volleyball

Zhou's research stated that the sport of volleyball is a game in which the players were engaged in position rotations. In the game, there are both attackers and defenders. The volleyball tournament is very dynamic, and players often run to change direction or jump vertically to get the ball. During the game, the players always move quickly and carefully with consciousness of their actions[6]. Tian's research concluded that volleyball is a sport involving teamwork with a small ball and speedy movements, so it was difficult to analyze the degree of volleyball movements with a visual system and wearable devices. Therefore, the algorithm for estimating the ball movements by a visual machine, wearable devices to detect different pictures, and wearable optical sensing devices for movements had to be suitably adjusted to show that some parts of the body played important roles in predicting ball throwing[7], [8]. Ying's research found that volleyball was one of the most popular sports. Spine and shoulder assessments in serving and attacking with asymmetrical movements might cause negative effects on postures and bodies, especially in teens. Most players in the higher levels of games had to exercise vigorously and regularly[9]. Detchirakun's research described that volleyball was a team sport with at least six players. The game is played on a ground divided with a net and uses a ball as a device. The players use parts of their body to hit, punch, and slap the ball over the net so that it falls in their opponents' area. In a similar manner, they defend so that the ball does not fall in their area[1].

In conclusion, volleyball is referred to as a sport involving teamwork. The players can be of any gender and age. The game is played both indoors and outdoors, with 12 players divided into two teams of six in each team and some substitutions. The court has clear boundary lines and a net to separate each team. The players use their hands to hit the ball over the net, back and forth between the teams. It is prohibited to hold the ball; the ball must travel in the air by hitting it over the net. Each team can play the ball three times consecutively before sending it to the opponents' area. If no team member makes contact with the ball hit by the opponent team, that team would be the loser and the winning team will be awarded a score of one (rally point). The game must continue until the ball falls to the ground or cannot be sent to the opponents' area.

8.2 Practice Skills

Barker's research stated that systemically and regularly training emotional skills or emotions met the purpose of increasing efficacy, pleasure, and satisfaction in playing sport, and the participants had more exercise. This demonstrates the importance of athletes developing learning skills to meet the needs of sports. Although most behavioral interventions served the same purposes as psychological skills training, they also had different characteristics by focusing on techniques for modifying or redirecting behaviors. Efficacy improvements, according to the purpose of changing behaviors, directly resulted from psychological skills training and behaviors, which were important aspects of psychological sports research. Important aspects of knowledge and understanding played roles in psychological skills training by creating behavioral interventions to modify cognitive behaviors and training program reviews[10]. Onsoi & Khamduang, They's research mentioned sports skills and training as a science that provided knowledge about principles for correctly and appropriately determining intensity and training methods in a training program for individual athletes. This gave consideration and regard to age, gender, experience, and individual differences, including energy systems, physical fitness, types of sports, and the learning abilities of individual athletes. These aspects made a contribution to the training plans at different timelines[11]. Panthong's research stated that sports skills training involves a systematic development of athletes to promote exercise and the playing of sports based on scientific knowledge of areas such as anatomy and physiology. It enables physical development, the development of learning through the mind and emotional mechanisms, and creates positive attitudes towards exercise and playing sport, dividing athletes according to their ages, genders, and abilities. According to statistics and data collected from United States' athletes who had won medals in the Olympic Games, their development from childhood to international competitions took about 20 years. The research identified the following principles of development. For development at all age ranges, trainings, competitions, physical recovery according to the principles of sports science, and sports skills training programs all had to be consistent with growth and physical literacies. These were the main principles leading to physical activities for development of the skills necessary to achieve excellence in sports. The childhood period was suitable for developing the skill to be athletic, with various exercise activities and playing a variety of sports. The adolescence period was a time of quick learning and adapting to sports by practicing and for development physically, mentally, emotionally and in attitude. These aspects affected all training program designs, competitions, and the

rehabilitation of athletes. Coaches should, appropriately and completely, plan for each stage of the development settings. Quality sports development settings and promotion of physical activity created new sports knowledge. In long-term planning for the athletes' development, the needs of their families should be considered, with integration between collaboration of the public and private sectors. The scientific principles and social needs may change regularly, so that the athletes' development and training formats must be continually improved with long-term planning, using scientific principles and human development theories together with various research for efficient sports planning and design[12]. Pimjan's research stated that sports skills and training were knowledge. Principles of training, formats, intensities, and accurate training programs should be considered based on ages, genders, experiences, individual differences, suitability for individual athletes, energetic systems, physical fitness, types of sports, learning abilities, awareness of individual athletes, and suitable training plans in each timeline[13].

It can be concluded that sports skills training refers to the science, knowledge, principles for learning, and practicing in a systematic manner, both in respect of sports skills and athletes' minds by giving consideration to the suitability of the individuals being trained. There should be focus on systematic and consistent training from suitable designated training programs for the trainees incorporating issues such as gender, age, experience, intensity, and duration, with techniques to modify, correct, and redirect the behaviors to improve the efficacies of the trainees.

8.3 Intelligent Sensor Technology

Liu's research stated that intelligent sensing technology was a fundamental detection device of intelligent systems. The biological organs, which are capable of sensing stimuli, play important roles in the interaction between humans and the external environment. The highly efficient, multifunctional skin-touch sensors were of great interest. Development of touch sensors with flexible capability and self-recovery, that are biodegradable, high-resolution, and self-driven have been used in many fields. In the future, touching sensors for intelligent systems may help to improve the quality of life and comfort in many respects. Intelligent wearable systems could collect large amounts of information at any time. Meanwhile, a high-resolution touching sensor system could interact between humans and computers or robots. Together with its flexibility, that makes the device much like human skin, it is possible to use such technology to

gain extensive advantages. Self-recovery would help to prolong the useful life of the device. Self-driving ability would lead to the accumulation of energy. Therefore, with the advancement of science and technology, the intelligent system incorporating these touching sensors might gradually change the lifestyles, thoughts and work of people[14]. Ahopelto's research stated that a smart sensor was a technology that was changing from basic sensing to smart sensing in almost every application domain. The smart sensor was a detecting system that combined processing from both analog and digital signals in the area with power management and wireless connectivity. Moreover, it could combine several signal transformations from many transducers and could detect a variety of parameters. As intelligent detection was continually developed, then intelligent automatic activities could take place[15]. Batchelor's research stated that a smart sensor was technology that was changing from basic sensing to smart sensing in almost every application domain. The smart sensor was a detection system that combined processing of both analog and digital signals in the area with power management and wireless connectivity. Moreover, it could combine several signal transformations from many transducers and could detect a variety of parameters. As intelligent detection continually develops, then intelligent automatic activities could take place in future[16]. Xhafa's research noted that the smart sensing network technologies and intelligent applications are found in every aspect of our daily lives. As activators for wireless sensing networks, they are used for checking and collecting intelligent data from our surrounding environment. This may enable many services for intelligent houses and cities in the future[17].

It can be concluded that the term intelligent sensor technologies refer to technologies that use sensor materials and devices to detect data with multifunctional performances. Their lifespans could be extended by self-recovery against biodegradation. They can be self-driven, and perform various tasks including taking various measurements of human organs and obtaining environmental information with detection systems for analog and digital signals. They also have multiple parameters for detecting transducers, enabling both wireless and wired connections with intelligent detection in almost all domains of the application. They can cooperate with any measuring device including signal transmitters or receivers and detect or measure data with powerful processing tools for increasing measuring efficacy.

9. RESEARCH METHODOLOGY

The purpose of this research was to develop volleyball practice skills with an intelligent sensor technology model which will support an athlete's practice and skills training. To achieve the research's objectives, the researcher undertook the following steps:

9.1 The synthesis of process training volleyball practice skills with intelligent sensor technology.

Table1. The synthesis element of volleyball practice skills. (Volleyball and Beach volleyball)

Constructs	Drills						Competency / Measurement					Personal for training	Place for training	Drill Testing & Evaluation
	Training program objective			Sequence /game	During	Skills parameters	Movement/ Motion	Fluency / Speed	Accuracy / Preciseness	Body			
	Hardy	Speedy	Mind										
(Miura et al., 2020) [18]	✓	✓		✓	✓		✓	✓			✓	✓	✓
(Kos et al., 2020) [4]	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
(Amato et al., 2020) [19]		✓		✓	✓	✓	✓	✓		✓	✓	✓	✓
(Moghdani et al., 2020)[20]	✓	✓			✓						✓	✓	✓
(Whitney Tramel, Robert G. Lockie, Keston G. Lindsay, 2019) [21]	✓	✓			✓	✓	✓	✓			✓	✓	✓
(Mosqueda et al., 2019)[22]	✓				✓		✓				✓	✓	✓
(Lin et al., 2019) [23]	✓	✓			✓	✓	✓	✓		✓	✓	✓	✓
(Training et al., 2018) [24]	✓	✓	✓	✓	✓			✓			✓	✓	✓
(Rauch et al., 2018) [25]		✓			✓	✓	✓	✓		✓	✓	✓	✓

Form Table 1, The synthesis element of volleyball practice skills is shown in Table1 that 5 elements are as follows:

(1) Drill, Training program and Objective (i.e., body hardy, speedy, sequence and game, during, volleyball's skills parameters)

(2) Athlete's competency and measurement (i.e., movement, motion, fluency, speed, body)

(3) Training for personal

(4) Place for training

(5) Testing and Evaluation of practice skill training

Table 2. The synthesis element of volleyball practice skills. (Volleyball and Beach volleyball)

Constructs	Material						Measurement		Functions					
	Mobility Devices (wearable)	Fixed Devices	Application Software	Network/Wireless	Data / Database / Cloud database	Object (Data Source)	Body measurement	Environment measurement	Processing	Sensor / Detection	Object assay	Identify location/Tracking	Send/Receive data	Feedback, Investigation
[26]	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
[27]	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
[28]	✓	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	
[29]		✓	✓	✓		✓			✓	✓	✓	✓	✓	✓
[30]	✓		✓	✓				✓	✓	✓	✓	✓	✓	
[31]	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
[4]	✓	✓	✓	✓		✓			✓	✓	✓	✓	✓	

Form Table 2, The synthesis element of intelligent sensor technology is show in Table2 that 3 elements are as follows:

(1) Material (i.e., mobility devices and wearable, fix devices, application/software, network/wireless, data/database/cloud database, object/data source)

(2) Measurement (i.e., body, environment)

(3) Functions (i.e., processing, sensor / detection, object assay, identify location / tracking, send/receive data, feedback, investigation)

9.2 Development of volleyball practice skills with intelligent sensor technology model.

The results from the document synthesis according to Table1 and Table2 were used to analyze the design and development of the volleyball practice skills intelligent sensor technology model by applying smart sensor technology.

9.3 Evaluation of volleyball practice skills with intelligent sensor technology model.

The researcher used the volleyball practice skills intelligent sensor technology model which had been evaluated with the experts' assessment form. The experts came from the fields of the sport of volleyball and information technology and communication for education.

10. RESULT OF RESEARCH

10.1 The result of synthesize process training volleyball practice skills with intelligent sensor technology.

From Table 3, Analytic use of intelligent sensor technology to support the volleyball skill training process, it is found that the use of intelligent sensor technology supports the volleyball skill training process. The objectives of the skill training are defined, the equipment is used to measure and use the data to process the performance of athletes. By measurement of movement athlete's agility and physiology are focus on individual measurements and evaluate on the performance of athlete's skills practice.

10.2 The result of develop volleyball practice skills with intelligent sensor technology model.

The document synthesis data is provided in Table 3. The Volleyball Practice Skills Intelligent Sensor Technology Model was designed as depicted in Figure 2.

Table 3. Analysis and synthesis the intelligent sensor technology support to volleyball practice skills.

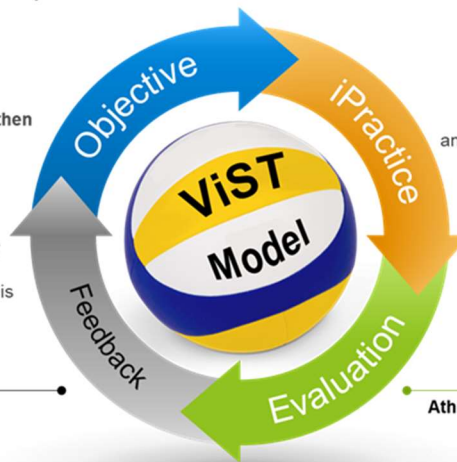| Analysis of Practice skills (Volleyball & Beach Volleyball) and Intelligent Sensor Technology		Material						Measurement		Functions				
		Mobility Devices	Fixed Devices	Software /Application	Network /Wireless	Data /Database	Object (Data Source)	Body measurement	Environment	Processing	Sensor /Detection	Object assay	Location /Tracking	Send /Receive data
Drills Training program (objective)	Hardy	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓		✓
	Speedy	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Sequence & Game	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓
	During	✓	✓	✓	✓	✓		✓		✓	✓			✓
	Skills parameters	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓
Athlete's competency measurement	Movement		✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
	Fluency Speed	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓		✓
	Body	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓		✓
Personal for training		✓		✓	✓	✓		✓		✓	✓		✓	✓
Place for training				✓	✓	✓	✓		✓		✓	✓		✓
Drill Evaluation				✓	✓	✓		✓	✓	✓	✓	✓	✓	✓

Figure 2. Volleyball Practice Skills with Intelligent Sensor Technology Model (ViST Model)

ViST Model

From Figure 2. The ViST Model consists of 4 sections: First session in blue (Objective) define to objectives of training and improving the practice skills training program accordingly. Second session in orange (iPractice) mean to the skills training process with intelligent sensor technology. Third session in green (Evaluation) mean to the assessment of results each objective skill testing. And the last session in gray (Feedback) means sending the evaluation results feedback to develop and improve training methods. Each session is described as follows.

Section 1 Objective

Define objectives of training and improvement skills training program accordingly concordant that includes design analysis to improve deficiencies of skills training program and applied technology.

Define objectives of skill training to categorize skills training programs such as Program 1 is suited to athletes who want to improve in their basic skills, Program 2 is used to strengthen muscles which use to playing each sport. Example in case volleyball has basic skills requirement for new athletes that skills

need to be trained for higher performance. And athletes can play these skills effectively and naturally for maximum effective. Training is required to properly design.

(1) Volleyball skills training program is divided into 2 parts.

a. Volleyball basic skills training program is a practice skill exercise in basic posture use in volleyball such as use of venue, basic rules of volleyball.

b. Volleyball advanced skills program that is practice skills in this section are unique to volleyball. About advance techniques of volleyball that is strategies, rules of offensive and defensive games. In competitive to gain an advantage that is requires the strategic optimization of volleyball by experts.

(2) Volleyball practice skills training program to reinforcement competency. Define practice skills training program according to objectives is very important. A required of sports science knowledge are required to design practice skills for training program. The goals of practice skills design for training program are follow as:

a. Strengthens to endurance of the athlete's body.

b. Enhance to mental strength of athletes. When they confront with pressure or stress.

c. Make to accuracy in the required skills.

d. Make to agility for athletes.

(3) Analysis and improvement details as follows:

The assessment results from skills training that have been tested in 3 parts.

Part 1 Pre-testing before training

Part 2 Assessment test during to training program.

Part 3 Post-testing after training

Analysis and improvement as follow:

a. Improvement program and drills volleyball skills to achieve results of athlete's competency to requirement.

b. Fix bugs and improve the system of intelligent sensor technology to enhance efficient, up-to-date, ready-to-use.

Section 2 iPractice

This section is the process of training skills with intelligent sensor technology. The skills training process is divided into 3 steps.

Step 1: The process before training is to collect athlete's history. Competency and skill testing. Before attending to training program. (Pre-test)

Step 2: Intelligent matching system between skill training program with athlete. (Athlete and Practice Skills Program Intelligent Automatic Matching System)

Table 4. Approach table (Approach of Model)

Process	Description	Technology	Evaluation
1. Define the training objectives of volleyball practice skills with intelligent sensor technology.	1. Volleyball Skills Training Program (Basic skills and Advanced skills) 2. Training program to strengthen 3. Improvement and development	1. Theoretically learning of physical education that is rules of volleyball game and playing. 2. Principles of system development and analysis SDLC, DFD, UML	Evaluation's accomplishment of skills training program and systems used for improvement.
2. Practice volleyball skills training with intelligent sensor technology	1. Performance pre-test before training 2. The system automatically matching between the athlete with the training program. 3. Start training for skills according to the program. 4. Assessment sub-performance test 5. Training program process system to give guidance, improve sub-performance training automatically. 6. Training program is due.	Volleyball skills practice system with intelligent sensor technology consists of: 1. Automatic sensor and detection equipment software 2. Wireless connection 3. Database management system (local & cloud) 4. Maintenance and Service system SLA, SDLC, ITIL	1. Performance assessment before training 2. Evaluation of the sub-drills
3. Assessment of athlete's performance	1. Performance test after training 2. Automatic performance testing and evaluation processing system by information obtain from whole training.	Volleyball skills practice system with intelligent sensor technology	Assessment of athlete's performance according to objectives of training program.
4. Data send back for analysis and improvement	1. Accomplishment performance test after training report. 2. Automatic competency test report with evaluation processing system by information obtain from whole training.	Volleyball skill practice system with intelligent sensor technology	All information acquires completely

Step 3: The process of attending sports training when received results of matching to training program. Athletes begin to enter the skill training process. During training has sub-competency test. (Assessment Smart Testing) And processing system to process sub-testing that is immediately adjust skill training to athletes to finding their desirable characteristics. Drills of skill is conducted until program training period to finish and assessment smart test is complete 100%.

Section 3 Evaluation

Assessment of results with objective skills testing that is automatic processing.

(1) Take competency and skills tests after attending a training program. (Post-test)

(2) The system automatically analyzes to all tests.

(3) The system will send a summary report that includes to trainer or coach automatically.

Section 4 Feedback

Delivery to results of evaluation for develop and improve training methods. Submit to assessment results obtained from the volleyball practice skills with intelligent sensor technology system. Return to analysis for bug fixes and further developments i.e., Test report (Compares and summary), Analysis and Improvement report, for training methods and intelligent sensor technology system.

10.3 The result of evaluate volleyball practice skills with intelligent sensor technology model.

The researcher collects data from the evaluate form by experts to process the results as show in Table 5.

Table 5. The appropriateness of Volleyball Practice Skills with Intelligent Sensor Technology Model (ViST Model)

Appropriateness of ViST Model with Athlete's training program			
Part of description	**Result**		**Rate of appropriateness**
	Mean	**S.D.**	
1. Objective			
1.1 Volleyball practice skills	4.73	0.47	Highest
1.2 Volleyball practice skills for Strengthen	4.55	0.52	Highest
1.3 Improve training program and smart sensor intelligent technology system	4.64	0.50	Highest
2. iPractice			
2.1 Practice skills Pre-test.	4.82	0.40	Highest
2.2 Athlete and Practice skills program Automatic matching	4.82	0.40	Highest
2.3 Begin training program and Assessment test until finish	4.73	0.47	Highest
3. Evaluation			
3.1 Practice skills Post-test	4.64	0.50	Highest
3.2 Objective Summary.	4.73	0.47	Highest
4. Feedback	4.73	0.47	Highest
5. ViST model process optimize to Principles of Skill Practice	4.82	0.40	Highest
6. ViST model can use to skills training program according to objectives.	4.82	0.40	Highest
Total	4.74	0.45	Highest

Note: Mean >= 4.51 is equal to highest level.

11. DISCUSSION AND CONCLUSION

The results of the evaluation of the volleyball skills practices using intelligent sensor technology were as follows. The first part was at a high level, the second part was at a high level, the third part was at a high level, and the fourth part was at a high level. Using the ViST Model to develop the athletes' skills was appropriate at the highest level, and the ViST Model could be used to practice skills according to the purposes of the skills training program at the highest level. With regard to using the ViST Model to develop a volleyball skills training system with intelligent sensor technology, the experts commented that "evaluation results obtained from the system should be split and sent back for analysis". This would enhance the model with more completeness.

The ViST model in this research is a conceptual framework for using smart sensor technology in combination with a volleyball skill training program to create potential athletes based on the standards of a volleyball training program. It can be used effectively in other sports that have similar processes and methods of practical skills.

Using the ViST Model to develop a volleyball skills training system with intelligent sensor technology would enable the athletes to break limitations of time and workforce. The objectives of the volleyball skills training system with intelligent sensor technology were to design such a system to fill the training gaps, allowing athletes to spend their training time worthily, as suitable for their bodies, and flexibly utilizing training opportunities. The training supports, that is, environments, locations, coaches, database management systems, intelligent programs, automation equipment (such as robots), wireless connection networks (such as Cloud, Wi-Fi) had to be supplied, including maintenance planning and improvement.

Adoption of the ViST Model to develop a training skills system for athletes provides the advantages of computer technology accuracy and precision that enables athletes to develop their volleyball skills with high efficacy, according to the objectives. This will enable them to remedy problems and quickly build athletes with desirable characteristics who will achieve good reputations and rewards from international competitions.

12. ACKNOWLEDGMENTS

13. DECLARATIONS

Conflicts of Interest: The authors declare no conflict of interest.

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