ESTABLISH THE EXACT PROCEDURES FOR THE SVAS (SITTING VOLLEYBALL ASSESSMENT SKILLS) APPLICATION

Andri Asrul Setiyawan[1], Mohammad Furqon Hidayatullah[2], Sapta Kunta Purnama[3], Fadilah Umar[4], Febriani Fajar Ekawati[5]
Program Studi Ilmu Keolahragaan, Fakultas Keolahragaan, Universitas Sebelas Maret, Surakarta
Email: andriasrui.ior01s3@student.uns.ac.id

Abstract:
Establishing detailed test implementation procedures (establishing the exact procedures). This activity aims to produce standardized, systematic, easy-to-implement, and consistent measurement procedures so that each athlete is tested under the same conditions and mechanisms. The research method used is test construction research and development. Based on the results, the test implementation procedures using the SVAS application are systematically structured, from the initialization stage to the presentation of statistical results. The procedure begins with entering team and athlete identities, followed by determining categories and matches, selecting teams and lineups, selecting observation sources, and recording athlete skills during matches. The conclusion of Establishing the Exact Procedures results in standard procedures for using the SVAS application, which include data initialization, match preparation, lineup determination, video source selection, skill recording, success status classification, recording attack directions, rotations and substitutions, match finalization, and statistical presentation. This standardization of procedures serves as the basis for the measurement process to be implemented consistently and replicated across different athletes and matches.
Keywords: Application, SVAS

1. Introduction

Advances in digital technology have created fundamental changes in the world of sports, particularly in terms of evaluating athlete performance. Technology serves not only as a training aid but also as an objective and efficient instrument for measuring athletes' physical, technical, and cognitive abilities in various sports. One form of this innovation is the use of digital applications, whether desktop-, web-, or mobile-based, to monitor, analyze, and evaluate athlete performance in real time. According to (Bompa & Buzzichelli, 2019) in the e-book Periodization: Theory and Methodology of Training, performance measurement in sports aims to provide accurate feedback to coaches and athletes so that training programs can be tailored specifically. Digital applications exist as tools that simplify the process of collecting performance data, previously done manually, into an automated and systematic one.

The development of testing applications in the world of sports represents a digital transformation in the process of evaluating athlete performance. In the context of adaptive sports like sitting volleyball, these applications play a crucial role in developing more inclusive, objective, and efficient evaluation methods. Test applications are digital platforms designed to measure athlete skills through measurable parameters such as accuracy, reaction time, motor coordination, and technical precision. According to (Balsalobre-Fernández et al., 2015), digital applications significantly contribute to sports assessment systems through their real-time data processing capabilities and instant feedback. This shifts the evaluation paradigm from a subjective manual system to an accurate and efficient digital system.

In sitting volleyball, a major challenge in performance evaluation is adapting tests to the physical conditions of athletes with disabilities, such as limited lower-body mobility. Therefore, specialized evaluation instruments are needed that take these characteristics into account. (Tweedy et al., 2016), emphasized the importance of a standardized and adaptive approach to evaluating Paralympic athletes, including those in sitting volleyball. The tests developed should assess fundamental technical skills such as passing, serving, and smashing performed in a sitting position, and reflect the demands of the actual game. Using applications in the testing process offers numerous benefits, including time efficiency, ease of monitoring results, and reduction of subjective bias in assessments. (Pambudi et al., 2023), stated that

digital applications can improve the quality of coaches' decision-making processes because they are based on measurable data and analysis. In the world of disability sports training, these applications are a crucial tool in mapping athletes' potential and developing appropriate training programs.

Furthermore, the development of applications in adaptive sports must consider the principles of inclusivity and accessibility. (Hidayat et al., 2018) emphasize that disability sports technology must ensure that the developed system is easy to use by athletes and coaches, both in terms of interface, language, and functional features. In developing an application for sitting volleyball, this can be achieved through responsive design and features tailored to the user's physical abilities (Munir et al., 2024).

2. Literature Review

Sitting volleyball is categorized as an open skill sport, meaning players must respond to stimuli in a dynamic and uncertain environment. Therefore, app-based testing instruments must be able to capture the variety of movements and actual playing conditions. According to (Fernando, 2022), in open skill sports, evaluation systems must be designed flexibly and realistically so that results reflect the true abilities required in competition. Therefore, developing a sitting volleyball testing app is a strategic step in improving assessment quality, strengthening the talent scouting process, and supporting the comprehensive development of athletes with disabilities. The use of this technology aligns with the direction of modern sports science policies, which are data-driven and inclusive of all groups.

Digital applications allow coaches and athletes to access performance data anytime and anywhere. This is particularly beneficial in the context of disability sports or those with limited geographic or mobility limitations (Zhao et al., 2024). With the help of a visualization-based dashboard, the application allows coaches and athletes to gain a deeper understanding of performance patterns. Graphic visualizations and numerical scores make performance data more communicative and easier to analyze (Kardiyanto et al., 2024).

The use of application technology in sports evaluation offers benefits in terms of accessibility, time efficiency, accurate data acquisition, and real-time feedback. Application technology also contributes to the transparency of test results, which are directly inputted, ensuring data-based results that are accessible to anyone. The use of applications leads to the use of technology in sports, particularly in the development of web-based testing and measurement applications.

Several studies related to the proposed idea include those conducted by (Fenton et al., 2022), which found that developing web-based applications is inexpensive. Therefore, the application was developed using open-source software. PHP was used for the programming language, and MySQL was used for the database, both included in the XAMPP application package. The application development method used was the Waterfall model of the Software Development Life Cycle (SDLC), ensuring effective and efficient development. (Triprayogo et al., 2020) Information technology makes it easy for anyone to access information. Applications, as learning platforms, are the perfect place to apply information technology. Distance is no longer a barrier to learning.

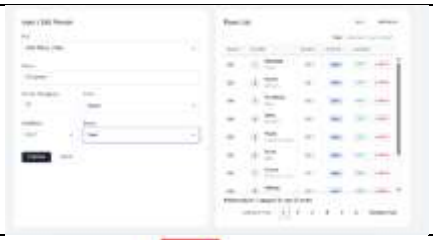
3. Research Methods

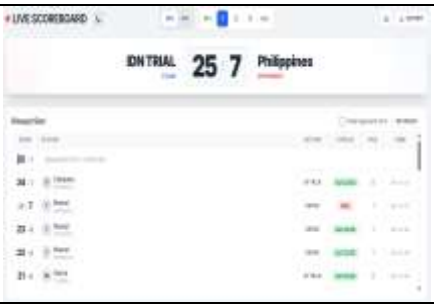
The research method used is the research and development of test construction by (Johnson & Nelson, 1986). Test construction is created when existing tests are unsuitable, inaccurate, or even non-existent in testing a required variable. Test construction aims to design new products and procedures, which are systematically field-tested, evaluated, and refined until they meet certain criteria for effectiveness, quality, or similar standards. A researcher must understand that each motor skill has a different movement structure, success indicators, and level of complexity (Assyauqi, 2020). Instrument development is a systematic process to create a valid, reliable, and objective measurement tool. A good instrument must be able to measure what it is intended to measure consistently and accurately (Sugiyono, 2017).

4. Results and Discussion

Table 1. Standard Procedure for Implementing the Sitting Volleyball Skills Test Based on the SVAS Application

No	Procedure Stage	Implementation Procedures	Data/Actions Recorded	Output	Picture

1	Team initialization	The user opens the Team menu, then enters the team name and abbreviation.	Team identity	Team data saved	
2	Athlete initialization	The user opens the Player menu, selects a team, then enters the player's identity and attributes.	Player name, jersey number, position, classification and status	Saved athlete profile	
3	Category determination	User opens the Categories menu, adds a category, name, and description.	Type/category of match	Saved match categories	
4	Match fixing	The user selects team A, team B, category, match time, and match status.	Identity and match details	Match ready to be analyzed	
5	Team selection and lineup	The user selects the team to be analyzed, the match set, starting players, substitute players, and libero.	Line-up	*Saved match lineup*	
6	Selection of observation sources	Users select a source from YouTube, local video uploads, or a live camera.	Match recording source	Live video or match ready to watch	
7	Starting analysis	The user presses the Start button, so that the time and skill input features are activated.	Match time	The observation process begins	

8	Athlete skill input	Users select the athlete, skill type, result status, and attack direction.	*Passing/receive, serve, smash/attack, and block*	Individual skill data recorded	
9	Assignment of result status	Each action is classified based on its success outcome.	*Success, good, rally, bad, or fail according to the type of action*	The quality of each action is recorded	
10	Recording the direction of attack	For relevant skills, the user determines the attack direction zone.	Zones 1–6	Distribution of recorded attack directions	
11	Rotation and substitution	The system records automatic/manual rotations, player substitutions, and libero entries and exits.	Positions and substitutions	Updated line-up	
12	Ending sets and matches	Once a set is completed, the user ends the set and moves on to the next set; once all sets are completed, the match ends.	Results of the entire set	Match data finalized	
13	Monitoring and results	Users open match statistics results or categories	Frequency and quality of each athlete's skills	Individual and team statistics	

Based on the table, the test implementation procedure using the SVAS application is systematically structured, from the initialization stage to the presentation of statistical results. The procedure begins with entering team and athlete identities, followed by determining the category and match, selecting the team and lineup, selecting the observation source, and recording the athlete's skills during the match. In the core measurement process, the application allows observers to record the player performing the action, the type of skill, the status of the skill result, and the direction of the attack. Based on the application's interface, available action types include serve, attack, block, receive, dig, toss, and

opponent error. For the purposes of this study, the primary analysis focused on the four skill components established in the factor analysis stage: passing, serving, smashing, and blocking. In the application's operation, passing skills are represented primarily through the receive category, while smashing is represented through the attack category.

The status of each action is recorded based on its success level, such as success, good, rally, bad, and fail, according to the characteristics of the skill being analyzed. For actions related to the direction of the attack, the application also allows recording based on zones 1 through 6. Thus, the measurement not only provides information on the number of actions performed by the athlete but also on the quality and distribution of the direction of each skill. After all match data has been entered, the application generates match statistics that include score history, player skills, playing areas, and skill efficiency for each athlete. Furthermore, the system can present statistics by match category, allowing for broader analysis of athlete performance across multiple matches.

Establishing procedures is crucial in test development because measurement results are determined not only by the quality of the test items but also by the consistency of the implementation procedures. Differences in athlete data preparation, application use, video source selection, skill recording, or scoring can potentially result in measurement variations that are not attributable to the athlete's abilities. Therefore, all stages of using the SVAS application are defined in a standardized operating procedure. According to the SVAS application user guide, the procedure begins with the initialization phase, which involves entering team and player data into the system. Users first go to the Team menu to add a team name and abbreviation, then go to the Players menu to define the team and each player's attributes. Next, users can add categories and match details as a basis for analysis. Once the initialization process is complete, users enter the match execution phase by selecting a match, determining the teams to be analyzed, selecting a set, and establishing the lineups. The system differentiates between starting players, substitutes, and liberos. Once the lineups are determined, users can start the match and input player skill data.

The SVAS application provides three alternative observation sources: YouTube videos, locally uploaded videos on the user's device, and live cameras that can be used for live matches. Once a video source is selected, users press the Start button, activating the player selection and action input functions, and starting the time recording. During the skill recording process, users select players, action or skill type, success status, and attack direction. The application also provides player rotation, libero substitution, player substitution, set ending, and match ending functions. Once all the data is entered, the application generates match statistics and statistics by match category.

5. Conclusion

It can be concluded that Establish the Exact Procedures produces standard procedures for using the SVAS application, which include data initialization, match preparation, lineup determination, video source selection, skill recording, success status classification, attack direction recording, player rotation and substitution, match finalization, and statistical presentation. This standardization of procedures provides the basis for the measurement process to be implemented consistently and can be replicated across different athletes and matches.

Bibliography

Assyauqi, Moh. I. (2020). Model Pengembangan Borg and Gall. *Institut Agama Islam Negeriegeri*, (December), 2–8.

Balsalobre-Fernández, C., Glaister, M., & Lockey, R. A. (2015). The validity and reliability of an iPhone app for measuring vertical jump performance. *Journal of Sports Sciences*, *33*(15), 1574–1579. https://doi.org/10.1080/02640414.2014.996184

Bompa, T. O., & Buzzichelli, C. (2019). *Periodization-: theory and methodology of training*. Human kinetics.

Fenton, A., Parry, K. D., Chadwick, S., Guimarães, G., & Aeron, V. (2022). Digital Innovation in Sport – Barriers and Opportunities for Branded Fitness Apps for Fans. *Studies on Entrepreneurship, Structural Change and Industrial Dynamics*, (January), 25–42. https://doi.org/10.1007/978-981-16-4795-6_3

Fernando, J. (2022). Analisis Gerak Keterampilan Berbasis Aplikasi VAS (Volleyball Analysis Skill). *Jurnal Olahraga Dan Kesehatan Indonesia (JOKI)*, *2*, 94–99.

Hidayat, A., Muslimin, & Kasim, A. (2018). Pengembangan Perangkat Tes Dan Pengukuran Passing Bola Voli Berbasis Komputer the Development of Passing Test and Measurement Devices Computer-Based Volleyball. *Jurnal Sosioteknologi |*, *17*(2), 297–304.

Johnson, B. L., & Nelson, J. K. (1986). *Practical measurements for evaluation in physical education.*

Kardiyanto, D. W., Angga, P. D., & Setiyawan, A. A. (2024). Learning media innovation with assistive devices to improve motor skills of students with special needs and visual impairment. *Jurnal SPORTIF : Jurnal Penelitian Pembelajaran*, *10*(3). https://doi.org/10.29407/js_unpgri.v10i3.23066

Munir, A., Gontara, S. Y., & Umar, F. (2024). Hubungan Antara Kekuatan Otot Lengan Dan Keseimbangan Terhadap Kemampuan Passing Atas Bola Voli Pada Siswa Ektrakurikuler. *Jurnal Pendidikan Modern*, *10*(1). https://doi.org/10.37471/jpm.v10i1.1010

Pambudi, T., Mukarromah, S. B., Rahayu, S., & Iwandana, D. T. (2023). Efektivitas Aplikasi Data Base Kondisi Fisik Atlet Bulu Tangkis Berbasis Android. *Gelanggang Olahraga: Jurnal Pendidikan Jasmani Dan Olahraga (JPJO)*, *6*(2). https://doi.org/10.31539/jpjo.v6i2.6170

Sugiyono, S. (2017). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D. Bandung: Alfabeta, CV*.

Triprayogo, R., Sutapa, P., Festiawan, R., Anugrah, S. M., & Iwandana, D. T. (2020). Pengembangan media pembelajaran jurus tunggal pencak silat berbasis android. *Gelanggang Pendidikan Jasmani Indonesia*, *4*(2), 1–9. https://doi.org/10.17977/um040v4i2p1-8

Tweedy, S. M., Mann, D., & Vanlandewijck, Y. C. (2016). Research needs for the development of evidence-based systems of classification for physical, vision, and intellectual impairments. *Training and Coaching the Paralympic Athlete: Handbook of Sports Medicine and Science*, 122–149.

Zhao, J., Yang, Y., Bo, L., Qi, J., & Zhu, Y. (2024). Research Progress on Applying Intelligent Sensors in Sports Science. *Sensors*, *24*(22). https://doi.org/10.3390/s24227338