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Speed Test and Measurement Tools Shooting Sensor Based

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Abstract

Tool and test and measurement of shooting sensor-basedThis research was carried out on athletes from Darul Ulum Fc and Bangsal FC in May 2022. This type of research is a development research with a Research and Development (R&D) from Sugiyono. This research was conducted with this research carried out with 9 stages (1) Research and information collecting, (2) Planning, (3) Develop preliminary form of product, (4) Preliminary field testing, (5) Main product revision, (6) Main field testing, (7) Operational product revision, (8) Operational field testing and (9) Final product. The population in this study used athletes from Darul Ulum FA and Bangsal FC. The sampling technique used purposive sampling with the first phase of the trial, which consisted of 15 athletes from Darul Ulum FC and the second phase of the trial, which consisted of 17 Bangsal FC athletes. Furthermore, from the first stage of the trial, which amounted to 15 people, the figure was 93.16% with the Very Eligible criteria, then from the second stage of the trial which amounted to 17 athletes, the figure was 93.52% in the Very Eligible category. Based on the data obtained, the development of a shooting speed measurement tool is declared feasible to be developed as a sensor-based test and shooting.

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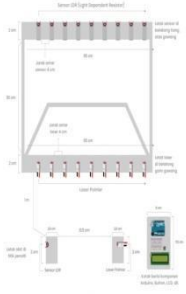
INTRODUCTION

Science and technology in the field of sports at the global level is growing. The rapid development of technology today makes people want to always innovate to develop a new tool that can be used easily and practically through research. Given the central role of science and technology for sports progress, it is time for research/research to be able to produce appropriate technology products in helping sports players in a country.

Shooting speed measuring devices have actually been developed in Indonesia, namely at the University of Siliwangi and the State University of Yogyakarta, where the measurement is simply inefficient. It is necessary to modify the equipment to measure shooting speed more efficiently and in accordance with its intended use.

Then to strengthen the background that the researchers designed, the researchers tried to conduct a preliminary study of the Ball Speed and Accuracy Measuring Tool on Penalty Kicks Using Arduino ", from the results of the literacy study that the researchers carried out there was a study developed by Reyna Indra et al (2019:232) entitled "Prototype Measuring Equipment for Speed and Ball Accuracy on Penalty Kicks Using Arduino" the results of the research carried out can be seen in table 1.1 as follows:

Table 1. Measuring Ball Speed and Accuracy on Penalty Kicks

No	Image	Description
	 Gambar 6. Arsitektur model alat ukur	Model Shape Weaknesses: Where at the penalty point there are two devices that detect the motion of the ball, which will make the tester uncomfortable when taking a kick

METHODS

The type of research in this research is qualitative research with development studies used in a study that must be based on the problem raised. The variables raised in the background of the problem will require a development and a method to solve it even though the research problem is the same but sometimes a researcher can choose one or more types of research development that can be used to solve the problem.

Participants

The subjects in this study were coaches, IT experts, test experts, and measurement and trial samples, namely futsal athletes from Medan city and wards FC athletes who will be the large group trials. The product trial in this study was divided into two stages, namely stage I (small group) involving 15 subjects of Mts Darul Ulum FA futsal players and stage II (large group) involving 17 subjects from futsal Bangsal FC

Sampling Procedures

Subjects are partly taken from the overall object under study and are considered to represent the entire population of Natoatmojo, (2005). In this study, it is not about the sample but the subject of the study. The technique of taking the subject in this study is to use a total sampling technique. The reason for taking total sampling is because according to Sugiono (2007) the total population is less than 100 and the entire population is the subject of all research.

The subjects in this study were coaches, IT experts, test experts, and measurement and trial samples, namely futsal athletes from Medan city and wards FC athletes who will be the large group trials.

The product trial in this study was divided into two stages, namely stage I (small group) involving 15 subjects of Mts Darul Ulum FA futsal players and stage II (large group) involving 17 subjects from futsal Bangsal FC

Materials and Apparatus

The components used in the sensor-based shooting speed test are as follows:

1. Arduino uno

Program of tools and work control of timekeeper

2 Sensor Proximity

As a motion detector and capture signal

3. Bluetooth hc 05

4. Regulator DC

operate electronic equipment, especially on electronic equipment that is digital

5. Baterai 18650

As a resource in the operation of the reaction speed test kit. In AT Mode it fu In AT M In AT Mode it functions as a configuration setting of the HC-05, while in Communication Mode it functions as wireless communication with other devices or devices.ode it functions as a configuration setting of the HC-05, while in Communication Mode it functions as wireless communication with other devices or devices.nctions as a configuration setting of the HC-05, while in Communication Mode it functions as wireless communication

Procedures

If you look at the findings of the research results when the researchers conducted Phase I and Phase II trials, there were advantages and disadvantages of this tool. The advantages include (1) Providing efficiency and effectiveness to samples in conducting tests and measurements, especially sensor-based shooting speed. (2) Can help the sample in knowing the speed of the kick (shooting). (3) The tool is portable, meaning it can be carried anywhere. (4) Increase knowledge about technological advances. (5) The measurement is made through the penalty point to the goal. (6) The results of the kick (shooting) are connected via the android system. (7) Changing manual tools towards the use of technology. Disadvantages include (1) Cannot read kicks (shooting) if the tester does 5 repetitions (2) Protective equipment components must be coated with a strong material so that when hit by the ball there is no damage.

This development goes through various stages, namely the design stage, the tool frame stage and the installation stage of the tools until they are connected to the android system. After the initial product is produced, it needs to be evaluated to experts through expert validation and needs to be tested on samples. At the evaluation stage, it was carried out on test and measurement experts, IT media experts and sports academics experts. The next stage of research is the product trial Phase I and Phase II trials.

In the validation process of expert test and measurement experts, IT media experts and sports academics experts are carried out using content validity which

according to Saifudin Azwar (2010:42) is content validity, namely validity based on expert opinion that the instrument is feasible to be used as a data collection tool. Evidence of content validity is obtained by agreeing with experts (expert judgment), namely test and measurement experts, IT media experts and sports academics. Based on the results obtained, it can be continued to the next stage because the tool is declared feasible and there are no revisions to this test tool.

Design or Data Analysis

The type of research in this research is qualitative research with development studies used in a study that must be based on the problem raised. The variables raised in the background of the problem will require a development and a method to solve it even though the research problem is the same but sometimes a researcher can choose one or more types of research development that can be used to solve the problem.

Subjects are partly taken from the overall object under study and are considered to represent the entire population of Natoatmojo, (2005). In this study, it is not about the sample but the subject of the study. The technique of taking the subject in this study is to use a total sampling technique. The reason for taking total sampling is because according to Sugiono (2007) the total population is less than 100 and the entire population is the subject of all research.

The subjects in this study were coaches, IT experts, test experts, and measurement and trial samples, namely futsal athletes from Medan city and wards FC athletes who will be the large group trials.

The product trial in this study was divided into two stages, namely stage I (small group) involving 20 subjects of Medan city futsal players and stage II (large group) involving 20 subjects from wards futsal athletes.

RESULT

The results of the first phase of the test on athletes are outlined through the formula for the presentation of the maximum number of answers/scores x 100% with the following results. From 15 small group trial samples with a total score of 1,118 divided by a maximum score of 1,200 x 100% resulting in a presentation of 93.16% with Very Eligible criteria. The results of the second phase of the trial for athletes are outlined through the formula for the presentation of the maximum number of answers/scores x 100% with the following results. Of the 17 samples of the Phase II trial with a total score of 1,272 divided by a maximum score of 1,360 x 100% resulting in a presentation of 93.52% with Very Eligible criteria.

DISCUSSION

So far, there have been tools for shooting speed tests using Arduino Reyna Indra et al (2019: 232), but these tools are still hard to come by and rare and their use is less effective and efficient. This test aid is only available at Majalengka University and a shooting speed test development tool using a vibration sensor Dhia Arry Purwandaru (2020:36) its use is less efficient and less effective to carry because the tools used are too large and this tool is only available at the University Yogyakarta State. In fact, those who need this tool are all futsal athletes who want to measure the speed of their kicks, including athletes in the city of Medan. For those who are outside the city of Medan, it is very difficult to use and carry this tool. For this reason, it is still necessary to develop a shooting speed test tool that is simpler, cheaper and easier to implement so that it is easy to obtain for athletes and coaches in the regions, especially in the city of

Medan. On this basis, the researcher wants to develop a simple, effective and efficient sensor-based shooting speed test tool product

CONCLUSION

This development research produces a test tool and measurement of shooting speed in a sensor-based futsal game, which is expected to work effectively and efficiently so that it can be an attraction for athletes and coaches in activities to determine the results of athletes' shooting speed and for further researchers. This test tool is expected to provide convenience in measuring the shooting speed of athletes as well as accuracy in seeing the results of the athlete's shooting ability. In the implementation of tests and measurements, the data will go directly to the IOP device in the Android system.

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Yoepiter zega, born in medan on february 5, 1994 is the son of Mr. Edifati Zega and Mrs. Dahliana Nasution, the second of 4 children, namely Thityan C Zega, Yoepiter Zega, Eliawaty C Zega and Emmanuel Zega. The author received elementary school education at SD Negeri 068474 and graduated in 2006, junior high school at SMP Negeri 45 Medan and graduated in 2009, high school at YAPIM Mabar Private High School and graduated in 2012. After that the author continued his undergraduate studies majoring in Sports Coaching Education at the Faculty of Sports Science (FIK) Medan State University class of 2012 and was declared graduated in October 2016. At the beginning of his assignment, the author served as an honorary service at SMP Negeri 25 Medan in charge of teaching as a sports teacher. In 2020 the author continues his Masters study in the Postgraduate Program in Sports Science at the State University of Medan.

REFERENCES

Akhmad, I.,(2013). Dasar-dasar Melatih Fisik Olahragawan. Medan: Unimed Press.

Akhmad, I., Suharjo. (2016). Bleep Test Countermeasures Test Using Infrared and Microcontroller Based Computer System. International Journal of Science and Research (IJSR). ISSN: 2319-7064 Index Copernicus Value:79.57

Akhmad, I. (2017). Shuttle Tools: Designing The Bleep Test Tools As A Digital Aerobic Endurance System. International Conference On Innovation In Educations, Science And Culture. Lembaga Penelitian Universitas Negeri Medan.

Arikunto (2009). Prosedur Penelitian Suatu Pendekatan Praktik. Jakarta: Rineka Cipta.

Hiskia. (2007). Perkembangan teknologi sensor dan aplikasinya untuk deteksi radiasi nuklir. Prosiding PPI - PDIPTN 2007 Pustek Akselerator Dan Proses Bahan - BATAN, 12.

Jaya, Asmar (2008). Futsal: Gaya hidup, peraturan dan Tips-Tips Permainan. Yogyakarta : Pustaka Timur.

John D. Tenang (2008). Mahir Bermain Futsal. Bandung : Mizan

Marwan, I., Rohyana, A.& Listyasari, E.,(2016). “Model alat ukur kecepatan dan ketepatan tendangan penalti permainan sepak bola berbasis pengolahan citra digital”. Jurnal SPORT, vol.1 no.1, 108-124. https://journal.unsil.ac.id/index.php/sport/articl...

Maulana, I.R., Abdurrohman, M.S., Nurzaman, A.I. & Sujadi, H. (2019). “Prototipe Alat Pengukur

Kecepatan dan Ketepatan Bola pada Tendangan Penalti Menggunakan Arduino". Jurnal Prosiding Industrial Research Workshop and National Seminar, Vol 10 No 1. https://doi.org/10.35313/irwns.v10i1.1393

Miarso, (2007). Menyemai benih teknologi pendidikan. Jakarta. Pustekkom Dinas

Sudjana. (2002). Metode Statistika. bandung: Tarsito Bandung.

Sugiyono. (2010). Metode Penelitian Kuantitatif, Kualitatif dan R&D. Bandung: Alfabeta.

Suryono. (2018). Teknologi Sensor. Sensor Tekanan%0A Teknologi Sensor

Purwandaru, Dhia Arry. (2020). "Pengembangan alat ukur kecepatan laju bola cabang olahraga sepakbola". Skripsi Universitas Negeri yogyakarta. http://eprints.uny.ac.id/id/eprint/68805

Widiastuti (2017). Tes Dan Pengukuran Olahraga. Jakarta : Rajawali: Pers

Yogaswara D. , Dewi R. , Supriadi A. (2019). Android Based Speed Light Implementation of SAQ (Speed, Agility and Quickness) Improvements on Futsal Athlete U-16 League AAFI Regional Medan .Advances in Social Science, Education and Humanities Research,. Volume 384