Ring Sensor For Basketball Learning In Physical Education: Literature Review

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Abstract

The focus of the data in the literature review is "Ring sensor". Secondary data was collected using the systematic literature review (SLR) method, using the Preferred Reporting Items for Systematic Reviews and Meta Analysis (PRISMA) approach. Results; 1) The sensor ring is generally only used for basketball, badminton, futsal and volleyball matches. (2) The sensor ring has a display and tools that are very useful for showing the performance points produced by each player so that the coach/coach/teacher (physical education) is able to correct the results of the players' and/or students' achievements. (3) The cost of manufacturing and development, maintenance and repair is an important reference for making the sensor ring a support for physical education learning in schools, but its usefulness is very comparable. The ring sensor is worthy of being proposed as a learning medium considering its useful value, but what must be underlined is the calculation related to manufacturing and development costs, maintenance and repairs.

Keywords: Ring sensor; Basketball; Physical Education.

1. Introduction

The ability of an instructor to manage a class must of course always be in synergy with various developments of the times, one of which is by paying attention to, adopting, or modifying the latest and most up-to-date learning concepts and/or theories. Conceptual, pedagogical, cultural and political factors greatly influence the teaching and learning process and implementation of the model in the field [1]. The important things that must be prepared in order to produce an optimal teaching and learning process are policies, environment, curriculum, appropriate instructional learning, and assessment management that come from the latest sources [2]. In the physical education learning process, the elements of novelty and the use of renewable learning technology are important to develop and promote. In the nomenclature of physical education in Indonesia, one of the materials is the game "big ball", which includes football, basketball, volleyball and sepak takraw. Related to basketball, it contains learning material about the basic techniques of playing basketball. Basketball player be able to play well, including shooting, passing, dribbling, and pivoting [3]. The game of basketball has basic techniques that must be mastered by every player, namely; passing, dribbling and shooting, these three basic techniques cannot be separated in the game of basketball [4]. In general, the game of basketball is played using several basic techniques, including passing, dribbling and shooting. The basic techniques for playing basketball are; (1) passing ball, (2) dribbling ball, (3) shooting, (4) pivot, (5) rebound [5]. Especially for basketball shooting material, currently the world of physical education needs appropriate technology to support the learning process, in this case we see that the ring sensor has the

potential for this. In the future, ring sensors should not only be used for competition purposes, they can also be used for training and/or learning basketball shooting [6]. Of course, the use of appropriate electronic-based technology has its own advantages and disadvantages, including manufacturing and development costs, maintenance and repairs. Based on the explanation above, the researcher proposed this literature review. It is hoped that the data obtained from this literature review can be a source of information in adopting, developing and designing a friendlier "appropriate technology for basketball sensor rings", so that it can be used in physical education lessons in the future.

2. Methodology

Some concepts and procedures for literature review include; Secondary data collection can use the systematic literature review (SLR) method. The procedure for collecting data is by accessing journal indexers to make it easier to search using key words according to the theme to be reviewed [7]. A literature study is a research design that collects data sources related to a topic. Data collection using database search tools from Google Scholar, ERIC and/or Scopus using tools; search term in each database. The way this method works is by analyzing journals and then making summaries regarding research questions and objectives [8]. This literature review uses the Preferred Reporting Items for Systematic Reviews and Meta Analysis method or commonly referred to as PRISMA, this method requires certain stages to be carried out so that it is different from just a literature study/traditional review.

3. Result and Discussion

The following is a distribution and description of research results that describe the "Ring sensor" which is published in scientific journals.

Table 1. Results of data extraction (important findings related to research objectives and background)

Researcher's Identity	Journal name	Research findings
[6]	*5th International Conference on Physical Education, Sport, and Health* (ACPES 2019).	Product development in the form of an application "Single Operator Application (ASO)" which is intended for table officials at basketball matches. This application changes the scoresheet which was previously done manually to digital. This application helps table officilas who currently have to consist of four officers.
[9]	*Proceeding of National Conference on Asbis.*	Desktop and Android based digital scoring system that can be run directly via laptop and smartphone which can be connected to an LCD/LED TV so that it can be displayed directly during the match. This application is very practical to use and does not require large costs to operate.
[10]	Jurnal SINERGI	Produce a score board and timer using RGB LEDs which can be controlled via an Android smartphone. The score board and timer created can be used in several sports such as basketball, badminton, futsal and volleyball.
[11]	*IOP* Conference *Series: Materials Science and Engineering. Scoreboard*	Designing a universal scoreboard that can be used in matches in several sports such as basketball, futsal, ping pong, badminton. This scoreboard can be

	Wireless Universal Based On Microcontroller.	operated using cables and can also be operated without cables using a cellphone via communication using Bluetooth.
[12]	*8th International Conference on Social Network, Communication and Education (SNCE 2018). Development of Portable Ball Game Electronic Scoreboard*.	Aims to design a Portable Ball Game Electronic Scoreboard that can be used in various branches using 51 MCU controls, battery power, digital display, input buttons and wireless control module. Very suitable for several sports such as table tennis, badminton, volleyball and basketball games in stadiums.
[13]	Jurnal Teknoinfo	Produce a score board application using a p10 LED matrix which can be controlled via a smartphone with the Android platform. The score board application that will be created can later be applied to sports such as volleyball, futsal, basketball, volleyball and badminton.
[14]	*Gravity*: Jurnal Imliah Penelitian dan Pembelajaran Fisika.	The seven segment display can display decimal numbers from 0 to 9. By using IC 4026, IC NE555 and the seven segment display it will help the referee in recording the score of the match results. This scoreboard can be used in permanent sports venues such as stadiums or semi-permanent sports venues such as open fields.
[15]	Power Elektronik: Jurnal Orang Elektro	This tool utilizes Android technology as control. This tool is assembled on a microcontroller basis. With this Android control scoreboard, scoreboard control activities will be maximized.

4. Conclusion

Our findings show that: (1) Ring sensors are generally only used for basketball, badminton, futsal and volleyball matches. (2) The sensor ring has a display and tools that are very useful, such as showing the performance points produced by each player so that the coach/coach/teacher (physical education) is able to correct the results of the players' and/or students' achievements, in the game of basketball, namely shooting. (3) The cost of manufacturing and development, maintenance and repair is an important reference for making the sensor ring a support for physical education learning in schools, but its usefulness is very comparable. In line with the demands of the times which require the course of the physical education learning process to be revolutionary in the use of digital tools, the Ring sensor is worthy of being proposed as a learning medium based on its useful value, but what must be underlined is the calculation related to the costs of manufacture and development, maintenance and repair.

5. Reference

[1] S. Harvey, S. Pill, P. Hastie, and T. Wallhead, “Physical education teachers’ perceptions of the successes, constraints, and possibilities associated with implementing the sport education model,” *Phys. Educ. Sport Pedagog.*, vol. 25, no. 5, pp. 555–566, 2020.

[2] S. L. Michael *et al.*, “Rationale for the Essential Components of Physical Education,” *Res. Q. Exerc. Sport*, vol. 92, no. 2, pp. 202–208, 2021.

[3] M. F. Akbar, A. Priambodo, and M. Jannah, “Pengaruh Latihan Imagery Dan Tingkat Konsentrasi Terhadap Peningkatan Keterampilan Lay Up Shoot Bola Basket SMAN 1

Menganti Gresik," *Jp.jok (Jurnal Pendidik. Jasmani, Olahraga dan Kesehatan)*, vol. 2, no. 2, pp. 1–13, 2019.

[4] G. P. W. Prakoso and F. Sugiyanto, "Pengaruh metode latihan dan daya tahan otot tungkai terhadap hasil peningkatan kapasitas VO2Max pemain bola basket," *J. Keolahragaan*, vol. 5, no. 2, p. 151, 2017.

[5] D. Anggara, M. Usra, and S. Solahuddin, "Latihan Melempar Bola Basket ke Dinding dengan Sasaran Lingkaran Terhadap Shooting Free Throw Bola Basket pada Siswa SMP," *Altius J. Ilmu Olahraga dan Kesehat.*, vol. 7, no. 2, pp. 192–200, 2018.

[6] A. Mulyono, L. A. Farida, R. Irawan, and D. G. S. Wijayanti, "Single Operator Application for Table Official on Basketball Game," in *5th International Conference on Physical Education, Sport, and Health (ACPES 2019)*, 2019, vol. 362, no. Acpes, pp. 183–186.

[7] M. Ridwan, "Small sided games meningkatkan kebugaran jasmani dan keterampilan bermain sepakbola," *J. Sport Educ.*, vol. 3, no. 1, p. 35, 2020.

[8] M. Syofian and N. Gazali, "Journal of Sport Education (JOPE)," *J. Sport Educ.*, vol. 3, no. 2, pp. 63–74, 2021.

[9] M. Teguh Nuryadin, L. Permanasari, N. P. Ramadhan, and Heldiansyah, "Sistem Scoring Board Digital Bola Basket Berbasis Desktop Pada Persatuan Bola Basket (Perbasi) Kabupaten Barito Kuala," in *Proceeding of National Conference on Asbis*, 2019, vol. 6014, pp. 220–229.

[10] F. Supegina and Z. Iklima, "Perancangan Score Board Dan Timer Menggunakan Led Rgb Berbasis Arduino Dengan Kendali Smart Phone Android," *Sinergi*, vol. 19, no. 1, p. 13, 2015.

[11] S. Hutauruk, P. Siagian, and L. Sianturi, "Scoreboard wireless universal based on microcontroller," *IOP Conf. Ser. Mater. Sci. Eng.*, vol. 420, no. 1, 2018.

[12] P. Wang, "Development of Portable Ball Game Electronic Scoreboard," in *8th International Conference on Social Network, Communication and Education (SNCE 2018)*, 2018, vol. 83, no. Snce, pp. 44–48.

[13] M. N. D. Satria, F. Saputra, and D. Pasha, "Mit App Invertor Pada Aplikasi Score Board Untuk Pertandingan Olahraga Berbasis Android," *J. Teknoinfo*, vol. 14, no. 2, p. 81, 2020.

[14] A. Esmawan and G. Antarnusa, "Perancangan sistem penskoran olahraga dengan tampilan seven segment," *Gravity J. Imliah Penelit. dan Pembelajaran Fis.*, vol. 5, no. 1, pp. 99–108, 2019.

[15] M. Sungkar and U. Albab, "Pembuatan Aplikasi Android Score Board Led Matrix P10 Berbasis Arduino Stm32 Kendali Android," *Power Elektron. J. Orang Elektro*, vol. 8, no. 1, pp. 5–9, 2019.