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The Application of WiFi Module-Based Training Tool in Increasing Passing Reaction in Basketball Practice

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Abstrak

Tujuan penelitian ini untuk terciptanya sebuah media latihan berbasis modul wifi untuk digunakan dalam pelatihan khusus seperti pelatihan reaction sehingga dapat menghasilkan peningkatan reaction terutama dalam teknik passing pada cabang olahraga bola basket. Metode yang digunakan dalam penelitian ini adalah metode penelitian research and development. Sampel dalam penelitian adalah mahasiswa yang tergabung dalam tim putra basket UPI. Hasil penelitian ini menunjukkan bahwa media latihan berbasis modul wifi telah layak digunakan dan terdapatnya peningkatan dari skor pretest dan posttest pada pelatihan reaction dengan nilai signifikansi 0,000 < 0,05. Selanjutnya media latihan ini dapat digunakan untuk pelatihan reaction secara berkala.

Abstract

The purpose of this study was to create a wifi module-based training tool to be used in a special training such as reaction training to increase reaction especially in passing technique in basketball games. The method used in this study was research and development method. The samples of this study were students who were the members of UPI men's basketball team. The results indicate that the wifi module-based training tool is appropriate and there is an increase of reaction scores from the pre-test to post-test with the significance value of 0,000 < 0.05. Therefore, this training tool can be used for periodic reaction training.

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INTRODUCTION

Technology had shown great potential to monitor performance in sports, and it would be effective if coaches and athletes knew the goals and performance, if they felt the need to make corrections to techniques and training (Giblin, Tor, & Parrington, 2016). In addition, technology also had properties and functions. For example, in the past, an athlete's movements could only be analyzed in detail through video footage, while at this time they could suits with motion sensors that record them in motion. Based on athletic kinematic models, the system could provide a detailed analysis of their movements (Kos, Wei, Tomažič, & Umek, 2018). In this case, technological development could be used as an instrument to monitor physical activity, training, and provide measurements of data and detailed data in order to provide data for a more objective evaluation of training strategies and new approaches to how science was applied (Passfield & Hopker, 2017).

However, there were factors that had to be considered to observe the effects of technology on training such as intensity and duration of physical practice, the nature of cognitive tasks, the time when psychological tests were administered and the ability of participants in making decision (Davranche & Audiffren, 2007). In addition, it is common for sports to quickly pick up new technologies especially in the performance monitoring, and because of the advent of large scale consumer products are easily adapted for sports and technological innovation is increasingly more acceptable (Cuniffe, Proctor, Baker, & Davies, 2009) .

In the world of sports, training tool that was used as technology-based measuring devices already existed, especially to measure speed, fitness, reaction time, accuracy, and coordination for soccer. Training tool is called The Footbonaut in research (Saal, Zinner, Fiedler, Ralf, & Krug, 2018). The results of research conducted that footbonaut is a soccer training tool for training agility, reaction, and accuracy. The results show an increase in accuracy of 0.86%. This tool works can turn on the lights on the target panel, so players must quickly direct the ball to one of the target panels that randomly turns on the green light (Saal et al., 2018).

Associated with this research, researcher present ideas to create training tool of passing being inspired by footbonaut, forms and systems designed describe footbonaut which automatically turned on the lights indicating the target panel was a teammate who was waiting for the ball. But it was used in basketball passing reaction practice. Because indirectly in the game of basketball required monitoring the performance of technical training, especially those that required a quick reaction. Reaction speed was related to reaction time, and reaction time was defined as the time interval between the stimulus presentation and the performance that matched the voluntary response in a subject (Ghuntla, Mehta, Gokhale, & Shah, 2014). Reaction time was an important component of information processing because of the stimulus speed index, response processing and programming (Ghuntla et al., 2014). Furthermore, in reaction time, there are intervals that describe the size of the accumulated duration of three sequential and non -overlapping processing stages (Schmidt & Lee, 2014). Reaction time measures the level of movement preparation and it can correlate with movement speed and accuracy (Dean, Martí, Tsui, Rinzel, & Pesaran, 2011).

Related to this research, basketball players showed that coordination abilities such as orientation, differentiation, reaction, balance, and technical skills were an important part of basketball players training (Tsetseli, Malliou, Zetou, Michalopoulou, & Kambas, 2010). This term included additional practises that would improve expertise, stability and coordination of special techniques (Tsetseli et al., 2010). So far what has happened to basketball training methods is using aids such as cons, chairs, or pipes and the number of trainers is very limited in one team, so the training methods are felt to be less effective and there is no technology-based tools aids to improve athlete skills, especially for reaction. Therefore, it is necessary to design technology-based tools that can be used to monitor athlete's performance so that it can improve the ability of passing reaction, so researcher create alternative training tool, namely wifi module-based training tool to increasing passing reaction.

METHODS

The research method used is the method of research and development (R&D) (Gall et al., 2006)

which aims to make this training tool. The tools in this research have previously been validated in advance using expert judgment validation, but validation was done more to benefits of the tool as a training tool not as a test tool. The sampling technique used is total sampling. The sample chosen was 16 active college students are members of the UPI men's basketball with range aged between 19-23 years.

This training tool is used as a training aid tool when given treatment, so this study used one group that was given treatment through a wifi module-based training tool. The study was conducted for 5 weeks with 3 treatments per week. According to (Sajoto, 1988) an practise program 3 times each week to avoid chronic fatigue.

Instruments

The research instrument used by researcher in this study was to use a motion analysis application that was Kinovea 0.8.15. The purpose of the test using Kinovea was taking reaction time starting from the light up to the last ball touching the finger when passing toward the target box.

Data analysis

The data analysis techniques using SPSS version 22 with hypothesis testing using Paired Sample T-Test (Jack R Fraenkel, Wallen, & Hyun, 2012).

RESULT

In figure 1, there is information on the design of the wifi module-based training tool product, including LED Strip which is a visual indication for stimulus-response, using an iron frame with its size and wheels to be flexible, and there is a PCB Cover containing the components of the wifi module.

In its use in the field (see figure 2), it is seen when the treatment process is taking place. LED Strip is the main factor in the three stages of information processing for taking reaction time, in the application of this training tool is divided into three similar tools but with a focus for different passing, where tools with red

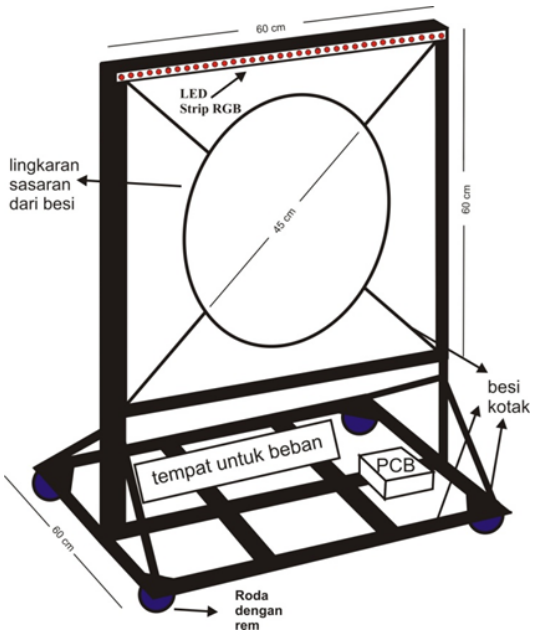

Figure 1. WiFi module-based training tool product design

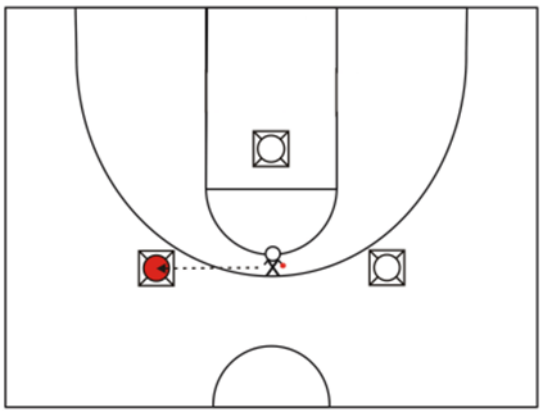

Figure 2. Training tool after setting on the field

Table 1. Description data of Pre-test and Post-test Reaction Test

Data	Pre-test	Post-test
N	16	16
Mean	.9500	.6575
SD	.06303	.11036
Min	.83	.50
Max	1.03	.88

LEDs are used for chestpass, green LEDs for bounce-pass , and blue LEDs for overheadpass.

In the statistical assumption test by using data analysis paired sample t-test, the results show that the reaction data has an average value pretest and posttest score of respectively .95 and .65. Because these data are time-based with the average pretest score .95 > .65 posttest. Based on its average score, that means there is an increase in reactions in other words faster than before. So it descriptively has seen an increase from the pretest to posttest data (see table 1):

Hypothesis test results in this study obtained the value of sig. 0.000 where the significance value is 0.000 < 0.05. So it can be concluded that there is a difference between the pretest and posttest scores. It means that there is a significant increase in passing reaction from the treatment through a wifi module-based training tool.

DISCUSSION

According to previous study, the application and development of technology in training programs improving the quality of training and performance of athletes so that it will affect performance (Dyer, 2015). In another study showed that technology development can be used as an instrument to monitor physical activity, training, and provide measurements of a broad and detailed data set so as to provide data for a more objective evaluation of training strategies and new approaches on how to apply knowledge (Passfield & Hopker, 2017). There had been many studies on reaction that used training tool or technology-based tool, such as measuring instruments in research (Gierczuk & Bujak, 2014) which were devoted to training the reaction time of Batak Pro which has twelve LED lights. There had been previous studies on wrestling that had used this measuring instrument. The advantage of Batak Pro was "it helps to improve reaction, hand-eye coordination, endurance and fitness". The reaction here is the time of a person's reaction regarding the time elapsed between the stimulus received immediately until the reaction is carried out. However, the reaction time itself will change based on several factors such as age, sex, condition, fatigue, high altitude, alcohol, and nicotine (Atan & Akyol, 2014).

Another study showed that complex reaction time is an important aspect of sport (Passfield & Hopker, 2017). In a study also said that reaction time is an important aspect in the ability of an athlete's perception. Therefore, the reaction was part of movement to the results of the stimulus process obtained through visual and audio. In some sports, especially sports games required basic technical skills obtained from the practise process such as a fast reaction. Reaction speed was the ability of a person to move quickly in anticipation of a stimulus (Ghuntla et al., 2014).

Related to the use of training tool repeatedly and systematically would affect the results, in this study an increase occurred during the pretest and posttest. This was done by researcher in thier research so as to get increased results from pretest scores to posttest scores. Beside that, the training tool were made as an alternative training tool for coaches and players in practicing basketball in which the purpose was to do special practice such as passing reaction in basketball. This training tool was created as a form of training tool innovation in basketball, especially in passing skills. Technological innovation related to sports science and performance improvement in the field is often viewed positively, with many sports organizations now seeking competitive advantage through innovation (Ringuet-riot, Hahn, & James, 2014).

Basically the working system of the wifi module-based training tool made it easy for coaches to give instructions in their training, or even made the training material more varied. This training tool working system was not difficult, enough to do the installation and operation as explained in the results section, after that this training media could be used in accordance with the wishes of the coaches. Based on research conducted by Saal on tools that have been made before, there are advantages to the tools in this research, where the wifi module-based training tool can be used outdoors, so that its use is more flexible compared to tools from previous research that can only be used in indoor. Through the use of the training tool, the samples appeared to be more effective in practicing, they also looked more enthusiastic and more focused in improving their passing skills on each tool with different passing techniques. This can be trained to continue in the training session, because in the use of the training tool which is very

supportive of improvement of reaction training in doing a skill move in basketball.

CONCLUSION

This training tool was made to be used as an alternative training tool for coaches and players in training where the aim was to increase reaction, especially in passing. In addition, based on the results of experiments conducted, it can be concluded that there is a significant effect of the treatment of wifi module-based training tool on increasing reaction passing, so making it easier for coaches to improve the reactions of their athletes with the help of the latest technology. If this tool is used in every basketball training, the progress of each player will be clearly seen because the results are more detailed and actual, so that the training process will be more effective.

RECOMMENDATION

Based on the results of this study, the suggestion proposed by the researcher so that wifi module-based training tool on the basketball training is going well, the researcher must continue this research further with other training tool, developing this practise media better in the future by adding notes other than the reaction of passing.

REFERENCES

Atan, T., & Akyol, P. (2014). Reaction times of different branch athletes and correlation between reaction time parameters. Procedia - Social and Behavioral Sciences, 116, 2886–2889. https://doi.org/10.1016/j.sbspro.2014.01.674

Cuniffe, B., Proctor, W., Baker, J. S., & Davies, B. (2009). An Evaluation Of The Physiological Demands Of Elite Rugby Union Using Global Positioning System Tracking Software. Journal Of Strength And Conditioning Research, 23(4), 1195–1203.

Davranche, K., & Audiffren, M. (2007). Facilitating Effects Of Exercise On Information Processing. Journal Of Sport Sciences, 22(5), 419–428. https://doi.org/10.1080/02640410410001675289

Dean, H. L., Martí, D., Tsui, E., Rinzel, J., & Pesaran, B. (2011). Reaction Time Correlations during Eye – Hand Coordination : Behavior and Modeling. The Journal Of Neuroscience, 31(7), 2399–2412. https://doi.org/10.1523/JNEUROSCI.4591-10.2011

Dyer, B. (2015). The controversy of sports technology : a systematic review. SpringerPlus. https://doi.org/10.1186/s40064-015-1331-x

Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2012). How to Design and Evaluate Research in Education. Climate Change 2013 - The Physical Science Basis (8 editions). New York: The McGraw-Hill Companies, Inc. https://doi.org/10.1017/CBO9781107415324.004

Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2012). How To Design And Evaluate Research In Education (Eighth Edi). New York, Americas: The McGraw-Hill Companies.

Gall, M. D., Gall, J. P., & Borg, W. R. (2006). Educational research: An introduction (8th edition). Boston: Allyn and Bacon.

Ghuntla, T. P., Mehta, H. B., Gokhale, P. A., & Shah, C. J. (2014). Influence Of Practice On Visual Reaction Time. Journal Of Mahatma Gandhi Institute Of Medical Sciences, 19(2), 120–122.

Giblin, G., Tor, E., & Parrington, L. (2016). The Impact Of Technology On Elite Sports Performance. Sensoria: A Journal Of Mind, Brain & Culture, (November), 2–9. https://doi.org/10.7790/sa.v12i2.436

Gierczuk, D., & Bujak, Z. (2014). Reliability And Accuracy Of Batak Lite Tests Used For Assessing Coordination Motor Abilities In Wrestlers. Pol. J. Sport Tourism, 21, 72–76. https://doi.org/10.2478/pjst-2014-0007

Johnson, R. B., & Christensen, L. (2014). Educational research: Quantitative, qualitative, and mixed approaches (Fifth edit). California: SAGE Publications, Inc.

Kos, A., Wei, Y., Tomažič, S., & Umek, A. (2018). The Role Of Science And Technology In Sport. Procedia Computer Science, 129, 489–495. https://doi.org/10.1016/j.procs.2018.03.029

Passfield, L., & Hopker, J. G. (2017). A Mine of Information : Can Sports Analytics Provide Wisdom

From Your Data ? International Journal Of Sport Physiology And Performance, 12(7), 851–855.

Ringuet-riot, C. J., Hahn, A., & James, D. A. (2014). A Structured Approach For Technology Innovation In Sport. Sport Technology, 6(3), 137–149. https://doi.org/10.1080/19346182.2013.868468

Saal, C., Zinner, J., Fiedler, H., Ralf, L., & Krug, J. (2018). Reliability And Validity Of A Soccer Passing Test Using The Footbonaut. German Journal Of Exercise And Sport Research, 2018(March). https://doi.org/10.1007/s12662-018-0511-6

Sajoto. (1988). Pembinaan Kondisi Fisik dalam Olahraga. Jakarta: Depdikbud Dikti P2LPTK.

Schmidt, R. A., & Lee, T. D. (2014). Motor Learning and Performance 5E - from Principle to Application.

Shadmehr, A., Ghotbi, N., & Moghadam, B. A. (2013). European Journal of Sport Science Reaction time and anticipatory skill of athletes in open and closed skill-dominated sport, (December 2016). https://doi.org/10.1080/17461391.2012.738712

Tsetseli, M., Malliou, V., Zetou, E., Michalopoulou, M., & Kambas, A. (2010). The Effect Of A Coordination Training Program On The Development Of Tennis Service Technique. Journal Biology Of Exercise, 6(1), 30–36.