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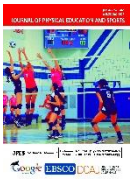

Development of ANS PONG as a Tool for Block Training and Smash in Table Tennis Games

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Abstract

Technology in table tennis sports, one of which is the ordinary ball launching robot called Robot drill. Expensive prices are one of the few causes that can be used. The purpose of this study is to: Develop ANS PONG product design for block and smash exercises, ANS PONG Production which is effective and affordable. The research method used is research and development. The results showed the quality of the product, based on the first expert evaluation, (table tennis lecturer) obtained a score of 90 excellent categories. Second expert evaluation (coach) with a score of 89 excellent categories. Evaluation of electronics experts with a score of 90 excellent categories. Conclusion: ANS PONG can be used as a block and smash training tool, effective as a block and smash training tool. It is recommended that ANS PONG is socialized and used for all athletes at relatively affordable prices. The advantages of ANS PONG That is using the remote control as a speed controller, ball spin and two-way drive fall of the ball, ANS PONG can also be set to a low height because it uses a tripod stand, using an Arduino microcontroller that can be set as desired, can for spin ball training, sidespin and backspin, easy to carry on sliding and move. It is recommended that ANS PONG be socialized and used for all athletes at relatively affordable prices.

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INTRODUCTION

The development and advancement of sports technology is necessary for the advancement of sports achievements. Suryo in Syakur, et al. (2017) explained that "this technology must be one of the main components in the national sports system, which must be managed seriously". Science and technology in the field of sports are experiencing more and more rapid development, namely the relationship between one field and another. So that a problem can be very complex because it is explained through a review of various angles of knowledge that are related and mutually supportive in other sports. This is evident from the increasingly advanced in terms of tactics, strategies, techniques, equipment, and equipment that greatly support the development and progress of sports.

In general, table tennis is a sport that is played by two people or four people (single/double) using a racket/bet that is coated with rubber to hit the celluloid through a net hanging on a table that is attached to a ring pole, as well as a table, balls, nets are regulated according to existing regulations. Table tennis game is one of the sports that began to develop in Indonesia. Table tennis is a sport that has quite a lot of fans among the people of Indonesia (Asri, Soegiyanto, & Mukarromah, 2017); (Safari, 2016); (Pujianto, 2015); Nuansari, Purnomo, & Yunitaningrum (2016); Jumadi, Simanjutak, & Hidasari (2017); (Helmi, 2016; Hirdaus, Atiq, & Supriatna, 2014).

Table tennis is a game that uses a table as a field bounded by a net that uses a small ball made of celluloid and the game uses a bat or called a bet. The basic idea of table tennis is to present the first ball by first bouncing the ball to the presenter table, and the ball must pass over the net and enter the opponent's target table and also return the ball after bouncing on the table by using a bet to hit the ball, the result of the ball passing through on the net and enter the opponent's target table. In presenting and returning the ball can be done by forehand and backhand techniques. Ministry of National Education quoted by (Tomoliyus, 2013). Table tennis games are quite complicated games, in addition to the rules that are quite difficult, the basic techniques available in table tennis games are also very complex. In order for someone to play table tennis, learning is needed and practicing stroke (punch) skills. Blows, in general, can be grouped as punches that are offensive attacks, produce topspin balls and punches are defensive, producing backspin balls) (Hodges, 2007).

The basic techniques that are often used in table tennis games are blocked and smash techniques. According to Rizka (2015) in the study analysis of the technical skills of playing in the table tennis game, it was suggested that in a table tennis game the techniques often used are block blow techniques and smash punch techniques. For that, every athlete who wants to succeed in playing table tennis must master well in the block blow technique and smash punch technique.

Observations in each match in the table tennis championships at the national, regional and international levels shows that the table tennis game has a very good chance of being a champion. So that it is not useless if the development or improvement of table tennis performance needs to be considered for the future, for that there is a need for guidance. The process of coaching in sports can not necessarily be done briefly but requires a long and long process. To achieve an optimal achievement requires a system of training that is full of discipline, perseverance, determination and strong conviction and is based on high motivation.

In table tennis coaching there are many influencing factors, namely equipment, and facilities (Yulianto, Purnomo, & Yunitaningrum 2016).

In Indonesia, both urban and rural, there are now many table tennis associations. One of them is the Table Tennis Association Hati Kudus Yesus (PTM HKY) Semarang.

The results of observations and interviews with PTM HKY Semarang trainers on 30 September to 4 October 2017 PTM HKY training

schedule a week three times Tuesday, Thursday, and Saturday. Then for infrastructure facilities, PTM HKY Semarang has 4 tables, 4 net, and 1 gross ball a lot but do not have a ball throwing robot.

As a result of all the observations above, it can be concluded that of the three observation guidelines on implementation, the availability of facilities and infrastructure and the material/program of table tennis training at PTM HKY Semarang raises several problems including: (1) Less optimal training process due to insufficient training facilities and infrastructure with the number of athletes, (2) Less optimal training process because of the lack of a lot of ball feeder so the trainer hassles, (3) Less optimal training process because many athletes are busy playing alone, (4) Lack of motivation from athletes in participating in training programs because athletes feel they are waiting too long, (5) The number of balls that are often stepped on and lost in each exercise.

Based on the problem, it was concluded that the researcher would develop a ball throwing device (ANS PONG). ANS PONG is a drill ball thrower for block and smashes training. Here's the ANS PONG design.

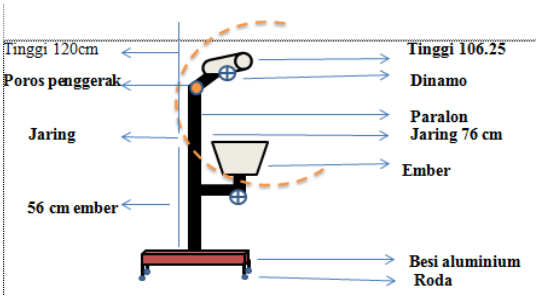

Figure 1. ANS Pong Design

Source: Researcher's illustration, 2018

The advantages of ANS PONG The constituent material from ANS PONG comes from items that we often encounter, such as paralon pipe with 2m diameter, stainless pipe, 3-volts and 12-volt dynamo DC, cables, nets, power windows and so on. Judging from its simple constituent material, it can be guessed that the cost of making modifications to this tool is more affordable and more concise.

METHODS

This research uses development research methods namely research methods used to produce certain products, and test the effectiveness of the product Sugiyono in Dianawati, et al. (2017). This study uses a descriptive procedure model approach, which is a procedure that outlines the steps that must be followed in producing a product. According to Riyadi, et al, 2012 "Research and development seeks to produce a component in the education and sports system through steps of development and validation". The procedure in the development research is as follows: (1) Potential and Problems, (2) Data collection, (3) Product Design, (4) Design Validation, (5) Design improvements, (6) Product Trial, and (7) Trials. (Sugiyono, 2011).

This research uses experimental design as a trial design. The design of this trial was carried out in two stages, namely a small group test with six adult athletes located at PTM Gunung Pati Semarang, and a large-scale test conducted on twelve student and adult athletes located at PTM Spin Semarang. The indicator of the success of this product is in the form of analysis of observations, interviews, discussions with table tennis expert/professional, table tennis coaches, athletes, and electrical experts, as well as the documentation of all subjects that have been tested in this research. ANS PONG is obtained from the results of drill block and smash comparison data using tools and without using tools.

RESULTS AND DISCUSSION

Research procedure that has been carried out, produces the final product, a tool called ANS PONG. Here's the final product picture from ANS PONG.

Figure 2. Final ANS Pong Products
Source: Research documentation, 2018

Interview Result

Data analysis and data interpretation are obtained from interviews, observations, and documentation. Based on the analysis of research data, obtained data about ANS PONG, the interview data can be classified as follows. (1) In a small-scale test, as many as 6 adult athletes stated that ANS PONG is comfortable, safe, can be used for further training, easy to operate and can be used as a substitute for trainers for drill training, (2) In a wide-scale test, as many as 12 student and adult athletes stated that ANS PONG is comfortable, safe, can be used for further training, easy to operate and can be used as a substitute for trainers for drill training.

Product Validation

Validation is carried out by a team of experts by observing ANS PONG products along with evaluation sheets and suggestions for experts. Evaluation sheets in the form of questionnaires that contain aspects of product quality. Expert advice sheets are used for researchers to revise or improve tools before being used for trials or after trials.

The results of filling out the questionnaire conducted by the expert team can be concluded that the expert team considers both ANS PONG as a tool for block training and smash for student and adult athletes.. Expert 1 (Mr. Zidni Luthfil Fuad, S.Pd., M.Pd USM table tennis lecturer) give a score of 90 for ANS pong as a table tennis training aid, expert 2 (Mr. Yohan Tri Murtono, Trainer of Pati District) gave a score of 89 for ANS pong as a tool for table tennis training, expert 3 (Mrs. Qoniah S.Pd., M.T as an electrical teacher at SMK Negeri 1 Semarang gives a grade of 90 for ANS PONG as a tool for table tennis training.

Evaluation results in the form of values above use a rating scale of 0 to 100 as shown in the following table.

Table 1. Questionnaire for Experts

Criteria	Assessment indicator	Comment/value/weight
Aspects of originality	Is the work of researchers	10
	Has distinguishing features compared to with similar sports technology (foreign-made)	5
	Has distinguishing features from previous development products	5
	Have advantages in terms of development results	5
Aspects of excellence	Have advantages in terms of product manufacturing materials	10
	Has advantages in terms of operating the device	5
	Have advantages in terms of equipment maintenance	5
Aspect of benefit	Has a high usefulness for a wide audience in supporting the efforts of table tennis sports development	10
	Have positive power from the application of technology	5
Economic aspects	Development of a simple ball throwing prototype (ANS Pong) for drill training can lead to other industries (Multiplayer Effect)	5
	Has commercialization potential and market reach	5
	Has an affordable price for the middle to lower economic community	10
Safety aspect	Have a good level of security for students table tennis athletes	5
	Have a good level of security for students table tennis athletes	5
Comfort aspect	Have a good level of comfort for student table tennis athletes	5
	Have a good level of security for adult table tennis athletes	5
	Total	100

Table 2. Score and Description of Development Model Quality Assessment

Scale	Interpretation
81 - 100	Very good
66 - 79	Good
56 - 65	Enough
41 - 55	Less
0 - 40	Very less

Source:
Nurhasan, Tes dan Pengukuran dalam Pendidikan Jasmani, Ditjen Olahraga (2001)

Table 3. Results of Interviews with Adult Athletes On Small-Scale Trials

Substance	Results of interviews with adult athletes						Conclusion
	1	2	3	4	5	6	
Comfort	**	**	*	*	*	*	Comfortable product
Safety	**	**	*	*	*	*	Safe product
Use for drill exercises	**	**	*	*	*	*	Products can be used for further training
Convenience	**	**	*	*	*	*	The product is easy to operate
Helps in substituting the trainer's function in drill training	**	**	*	*	*	*	The product can be used as an alternative to the function of the trainer in drill training

Table 4. Product Revision Results after Small-Scale Trial

Revised section	Revised results	Purpose
Paralon ball speed	Paralon thrower that has a ball throwing dynamo, plus a parade of size about 1 mm	Minimize the release of a slightly less stable ball.

Table 5. Interview Results That Have Been Conducted by Researchers in A Large-Scale Trial of 6 Student-Level Table Tennis Athletes are as Follows

Substance	Results of interviews with student athletes						Conclusion
	1	2	3	4	5	6	
Comfort	**	**	*	*	*	*	Comfortable product
Safety	**	**	*	*	*	*	Safe product
Use for drill exercises	**	**	*	*	*	*	Products can be used for further training
Convenience	**	**	*	*	*	*	The product is easy to operate
Helps in substituting the trainer's function in drill training	**	**	*	*	*	*	The product can be used as an alternative to the function of the trainer in drill training

Table 6. Interview Results That Have Been Carried Out by Researchers in Large-Scale Trials of 6 Adult Table Tennis Athletes are as Follows

Substance	Results of interviews with adult athletes						Conclusion
	1	2	3	4	5	6	
Comfort	**	**	*	*	*	*	Comfortable product
Safety	**	**	*	*	*	*	Safe product
Use for drill exercises	**	**	*	*	*	*	Products can be used for further training
Convenience	**	**	*	*	*	*	The product is easy to operate
Helps in substituting the trainer's function in drill training	**	**	*	*	*	*	The product can be used as an alternative to the function of the trainer in drill training

CONCLUSION

Based on the results of the trial research of the Small and Large Scale PONG ANS tool in PTM Gunungpati table tennis club and PTM Spin Semarang, it can be concluded that the first one is the ANS PONG product can be used as a tool for block training and smash in table tennis games, especially for athletes students and adults. And the second ANS PONG product is effective as a table tennis training tool for students and adults in terms of practice, block and smash exercises using ANS pong can be used by athletes without having to take the ball first, the athlete will focus more on training than the concentration divided by training conditions such as the existence of a ball that bounces everywhere makes the ball often trampled during an exercise program. If this is done routinely, then block blow and smash techniques will be maximized.

Then in terms of the aspect of time, training the bait and receive serve using ANS pong can reduce the queue during training because they have to take the ball first. Then in terms of energy, assist the trainer's performance in training. Then in terms of the aspect of the place, because it can be practical ANS pong, how to use it is very easy and can be easily assembled.

REFERENCES

Asri, N., Soegiyanto, & Mukarromah, S. B. (2017). Pengaruh Metode Latihan Multiball dan Koordinasi Mata Tangan terhadap Peningkatan Keterampilan Forehand Drive Tenis Meja. *Journal of Physical Education and Sports,* 6(2), 179-185. Retrieved from https://journal.unnes.ac.id/sju/index.php/jpes/article/view/17393

Dianawati, I., Pramono, H., & Handayani, O. W. K. (2017). Pengembangan Alat Sensor Gerak pada Garis Servis Double Event dalam Permainan Sepak Takraw. *Journal of Physical Education and Sports,* 6(3), 272-278. Retrieved from https://journal.unnes.ac.id/sju/index.php/jpes/article/view/14629

Helmi, B. (2016). Penerapan Variasi Pembelajaran Untuk Meningkatkan Hasil Belajar Pukulan Forehand Drive Permainan Tenis Meja Pada Siswa Kelas V111 Madrasah Tsanawiyah Al Abraran Perusahaan Terbatas Perkebunan Nusantara 11 Tandem Hilir 1 Tahun Ajaran 2015/ 2016. *Jurnal Ilmiah Stok Bina Guna Medan,* 4(2), 65-77. Retrieved from http://stok-binaguna.ac.id/jurnal/index.php/vol4-092016/article/view/57

Hirdausa, H., Atiq, A., Supriatna, E. (2014). Penerapan Metode Pembelajaran Quantum Teaching Terhadap Hasil Belajar Foucarehand Permainan Tenis Meja Dini Kota Semarang. *Journal of Physical Education Health and Sport,* 2(1). Retrieved from http://download.portalgaruda.org/article.php?article=174957&val=2338&title=penerapan%20metode%20pembelajaran%20quantum%20teaching%20terhadap%20hasil%20belajar%20forehand%20permainan%20tenis%20meja%20di%20smps

Jumadi, R. D., Simanjutak, V. G., & Hidasari, F. P. (2017). Pengaruh Metode Team Game Tournament Terhadap Kemampuan Hasil Servis Forehand Tenis Meja Siswa SMPN. *Journal Pendidikan dan Pembelajaran Untan,* 6(6). Retrieved from http://jurnal.untan.ac.id/index.php/jpdpb/article/view/19327

Hodges, L. (2007). *Tenis Meja Tingkat Pemula*. Jakarta: Rajagrafindo Persada

Nuansari, R., Purnomo, E., & Yunitaningrum,W. (2016). Survei Hasil Belajar Forehand, Backhand dan Smash Tenis Meja Peserta Didik SMK Negeri 3. *Jurnal Pendidikan Dan Pembelajaran*, 5(5). Retrieved from http://jurnal.untan.ac.id/index.php/jpdpb/article/view/15263

Pujianto, A. (2015). Profil Kondisi Fisik dan Keterampilan Teknik Dasar Atlet Tenis Meja Usia Dini di Kota Semarang. *Journal of Physical Education, Health and Sport,* 2(1), 38-42. Retrieved from https://journal.unnes.ac.id/nju/index.php/jpehs/article/view/3941

Riyadi, S. (2012). Multi Ring and Multi Level Basketball Game Development as a Learning Medium in Physical, Sports, and Health Education in Elementary Schools. *Journal of Physical Education and Sports,* 1(1), 69-74. Retrieved from https://journal.unnes.ac.id/sju/index.php/jpes/article/view/100

Rizka, F. R. (2015). Study Analisis Ketermpilan Teknik Bermain Cabang Olahraga Permainan Tenis Meja. *Jurnal Kesehatan Olahraga*, 3(2). Retrieved from https://jurnalmahasiswa.unesa.ac.id/index.php/jurnal-kesehatan-olahraga/article/view/11176

Safari, I. (2009). Pendidikan Hasil Belajar Teknik Dasar Menggunakan Net dengan Tanpa Menggunakan Net Terlebih Dahulu. *Eduhumaniora: Journal Pendidikan Dasar,* 1(2), 1-4. Retrieved from http://ejournal.upi.edu/index.php/eduhumaniora/article/view/2731

Sugiyono. (2011). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D.* Bandung: Alfabeta.

Syakur, M. A., Badruzaman, & Pramitha, S. T. (2017). Pengembangan Alat Bantu Latihan Pelontar Bola Futsal Berbasis Mikrokontroler dengan Menggunakan *Software* Pemograman Arduino. *Jurnal Terapan Ilmu Keolahragaan*, 2(1), 29-32. Retrieved from http://ejournal.upi.edu/index.php/JTIKOR/article/view/4963

Tomoliyus. (2013). *Pengembangan Instrumen Kemampuan Ketepatan Forehand dan Backhand Drive dalam Permainan Tenis Meja*. Yogyakarta: FIK Universitas Negeri Yogyakarta. Retrieved from http://staffnew.uny.ac.id/upload/131121717/penelitian/12.+Pengembangan+instrumen+Ketetapan+Forehand+dan+backhand+Drive+tenis+mejaNew+Microsoft+Office+Word+Document+_2_.pdf

Yulianto, D., Purnomo, E., & Yunitaningrum, W. (2016). Peningkatan Teknik Dasar Forehand Tenis Meja Menggunakan Modifikasi Meja pada Kelas XA. *Jurnal Pendidikan dan Pembelajaran*, 5(2). Retrieved from http://jurnal.untan.ac.id/index.php/jpdpb/article/view/13869